Freedom Industries FOIA

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For LT2 sampling!

Chromogenic/Fluorogenic Substrate Test (Quanti Tray)

1.0 Introduction -

Colilert Reagent is used for the simultaneous detection and conformation of total coliforms and *E. coli* in water, which is based on the Defined Substrate Technology (DST). DST utilizes indicator-nutrient which cause target microbes contained in the sample and incubated in the DST reagent system to produce a color change (or another signal i.e., fluorescence), both indicating and confirming their presence. Coliforms as defined by this method are all bacteria that possess the enzyme β-D-galactosidase with *E. coli* also possessing the enzyme β-glucuronidase. The enzyme in Coliform will cleave the Chromegenic Substrate of the Test Reagent releasing the Chromogen just as the enzyme in *E. coli* will cleave the Fluorogenic Substrate releasing a fluorogen.

By utilizing the Quanti Tray System and 97 well trays, an estimation of coliform and *E. coli* density ranging from < 1 to > 2,419.2 can be determined from a single 100 mL sample portion. Higher counts can be determined by diluting the sample and multiplying the result by the appropriate dilution factor.

2.0 Sample Requirements-

2.1 Acceptance Criteria

2.1.1 For Compliance Samples: Maximum allowable elapsed time between sample collection and sample analysis is thirty (30) hours.

2.1.2 For Non-Compliance: Maximum allowable elapsed time between sample collection and sample analysis is forty eight (48) hours.

2.1.3 For Raw Source Waters (Surface, Ground, Spring): Maximum allowable elapsed time between sample collection and sample analysis is (8) hours. Temperature of receipt must be <10°C. If sample exceeds the 8 hours and 10°C, it is to be analyzed; however, "NOT VALID FOR SDWA COMPLIANCE REPORTING" must be checked under laboratory remarks. Samples exceeding 30 hours are not to be analyzed.

2.1.4 LT2 Monitoring (E. coli): Maximum allowable elapsed time between sample collection and sample analysis is thirty (30) hours. Temperature of receipt must be less than 10°C

2.2 Rejection Criteria

2.2.1 Insufficient air space to facilitate mixing of sample.

2.2.2 Sample contains residual chlorine. (Blue flash appears)

2.2.3 Sample exceeds maximum allowable time requirements as stated above.

2.2.4 Information on the Water Bacteriological Report Form (EM-1) is insufficient. (No date or time of collection)

2.2.5 Sample container was not furnished by the Office of Laboratory Services.

3.0 Sample Types -

3.1 Source Waters (Surface, including LT2 Samples; Ground; Spring and Bottled)

3.2 Dairy Farms

3.3 Sewage Suspects

3.4 Recreational Waters (Bathing Beaches - Summer 2001)

3.5 Any Sample Requiring a Total and *E. coli* count

3.6 Swimming Pools requiring an estimation of coliform density

3.7 Flood/Disaster Samples requiring an estimation of coliform density

4.0 Reagents and Equipment -

4.1 For Analysis:

4.1.1 35.0° ± 0.5°C Incubator. (Walk-In or Environette)

4.1.2 Long wavelength (366 nm) Ultraviolet Lamp.

4.1.3 Color and fluorescence comparator.

4.1.4 Clear, sterile, non-fluorescent 120 mL bottle. (Graduated at the 100 mL mark)

4.1.5 Colilert (or Colilert-18) Reagent.

4.1.6 70% Ethanol

4.1.7 Quanti Trays (97 well)

4.1.8 Quanti Tray Sealer

Ex. 5 - Deliberative

4.1.9 99 mL Sterile Water Dilution Blanks (If Dilutions Are Required)

4.1.10 10 mL Sterile Pipets (Samples Requiring a 10^{-1} Dilution)

4.1.11 1.1 mL Sterile Pipets (Samples Requiring a 10^{-2} Dilution)

4.2 For Quality Control:

4.2.1. Quanit Cult Organisms:

4.2.1.1 *Pseudomonas aeruginosa*

4.2.1.2 *Klebsiella pneumoniae*

4.2.1.3 *E. coli*

4.2.2 Tryptic Soy Broth. (TSB) (Single Strength and Double Strength)

4.2.3 Brom Cresol Purple Solution

5.0 Procedure -

5.1 General Procedures (100 mL and Dilutions)

5.1.1 Turn on Quanti Tray Sealer. Green light will come on when sealer is ready (approximately 20 minutes).

5.1.2 Sanitize area with 70% Ethanol and wash hands.

5.1.3 Record sample temperature on EM-1 Report form with infrared thermometer (LT2 E. coli samples only).

5.1.4 Shake sample 25 times in 7 seconds with a 1 foot movement.

5.1.5 Determine the appropriate dilution from the following table:

Dilution	Sample Type
Full 100 mL Volume	1. Raw Source Waters (Ground) 2. Raw Source Waters (Springs) 3. Raw Source Waters (Bottled Waters) 4.* Raw Source Waters (LT2 Monitoring) 5. Dairy Farms 6. Recreational Waters 7. Drinking Water (Public or Private) Requiring a Count
10^{-1}	1. Raw Source Waters (Surface) 2.* Raw Source Waters (LT2 Monitoring)
10^{-2}	1. Sewage Suspects and Ditches where high counts are expected. If unsure, a full 100 mL and 10-2 may be run on the same sample giving a range of <1 to > 241,920. 2.* Raw Source Waters (LT2 Monitoring)

*Each LT2 Monitoring Sample requires 3 separate dilutions.

5.2 *For 100 mL:*

5.2.1 Remove excess sample by pouring off or removing it with a 10 mL sterile pipet so that only 100 mL remains.

5.2.2 Add 1 packet of Colilert Reagent and shake to dissolve completely.

5.2.3 Label back of 97 well tray with the Lab Number, Date, Time and Dilution Factor (1X for 100 mL portion).

5.2.4 Pour sample into 97 well tray and tap on small wells to dislodge air bubbles.

5.2.5 Place tray in the rubber mold on the Quanti Tray Sealer and press "Seal".

5.2.6 Place in 35.0°±0.5°C incubator for 24 to 28 hours (27 to 28 perfered).

5.3 *For 10^{-1} Dilutions:*

5.3.1 Follow steps 5.2.1 thru 5.2.5 from above.

5.3.2 Add one packet of Colilert to a 90 mL sterile water blank, cap and shake to dissolve the reagent.

5.3.3 Pipet 10.0 mL of sample into the 90 mL sterile water blank.

5.3.4 Shake 25 time, in 7 seconds with a one foot movement.

5.3.5 Label back of 97 well tray with the Lab Number, Date, Time and Dilution Factor (10X for 10^{-1} dilution).

5.3.6 Pour sample into 97 well tray and tap on small wells to dislodge air bubbles.

5.3.7 Place tray in the rubber mold on the Quanti Tray Sealer and press "Seal".

5.3.8 Place in 35.0°±0.5°C incubator for 24 to 28 hours (27 to 28 perfered).

5.4 *For 10^{-2} Dilutions:*

5.4.1 Follow steps 5.2.1 thru 5.2.5 from above.

5.4.2 Add one packet of Colilert to a 99 mL sterile water blank, cap and shake to dissolve the reagent.

5.4.3 Pipet 1.0 mL of sample into the 99.0 mL sterile water blank.

5.4.4 Shake 25 time, in 7 seconds with a one foot movement.

5.4.5 Label back of 97 well tray with the Lab Number, Date, Time and Dilution Factor (100X for 10^{-2} dilution).

5.4.6 Pour sample into 97 well tray and tap on small wells to dislodge air bubbles.

5.4.7 Place tray in the rubber mold on the Quanti Tray Sealer and press "Seal".

5.4.8 Place in 35.0°±0.5°C incubator for 24 to 28 hours (27 to 28 perfered).

5.5 Reading, Interpreting and Reporting

5.5.1 Remove the trays from the incubator after 24 hours incubation. Samples must be removed from the incubator with 28 hours. Because the sample is divided into 97 portions, some of the wells are slower to develop the color change. Therefore, it is preferable to let the trays incubate 27-28 hours.

5.5.2 Examine each well on the tray for the presence of a yellow color (confirming the presence of coliform bacteria) that is equal to or greater than the compartor. Wells that are slightly yellow, but not as yellow as the comparator, must be place back into the incubator to incubate for the full 28 hours. Samples left in the incubator for more than 28 hours must be reported as "Laboratory Accident" unless they are clear.

5.5.3 Count the number of large wells (including the very large well at the top of the tray) and the number of small wells that have a yellow color equal to or greater than the comparator and record in the "Conf24" column on the "Colilert Bench Sheet" (Attachment #1) as follows: # Large Wells/# Small Wells * Dilution Factor.

5.5.4 All trays that contain at least one yellow well (Total Coliform Positive Samples) must be taken into the Walk-In Incubator and checked for fluorescence with the 366 nm UV light. Wells with fluoresce equal to or greater than the comparator are Positive for *E. coli* and must be marked with a marker.

5.5.5 Count the number of large wells and the number of small wells that fluoresce equal to or greater than the reference comparator and record in the "E. coli" column on the "Colilert Bench Sheet" (Attachment #1) as follows: # Large Wells / # Small Wells * Dilution Factor.

5.5.6 Using the IDEXX Quanti-Tray/2000 MPN Table (Attachment #2) determine the number of total coliforms and *E. coli* as follows:

5.5.6.1 For total coliforms - read down the chart for the number of large yellow wells and across the top for the number of small yellow wells. The point where the column and row intersect is the MPN value for total coliforms based on 100 mL of sample. If a 10^{-1} dilution of the original sample was made the MPN value must be multiplied by 10. If a 10^{-2} dilution of the original sample was made the MPN value must be multiplied by 100. Record the computed value as it appears on the chart in the "Total Coliform" column of the Colilert Bench Sheet.

5.5.6.2 For *E. coli* - read down the chart for the number of large fluorescing wells and across the top for the number of small fluorescing wells. The point where the column and row intersect is the MPN value for total coliforms based on 100 mL of sample. If a 10^{-1} dilution of the original sample was made the MPN value must be multiplied by 10. If a 10^{-2} dilution of the original sample was made the MPN value must be multiplied by 100. Record the computed value as it appears on the chart in the second "E. Coli" column of the Colilert Bench Sheet.

5.5.6.3 If all wells are clear (Negative for Total Coliforms) then record as "0/0 * Dilution Factor" in the "CONF/COLI" column on the "Colilert Bench Sheet" and report as < minimum detection limit in the "TOTAL" column. Minimum Detection Limits are as follows: < 1 for 100 mL portions, < 10 for 10^{-1} dilutions and < 100 for 10^{-2} dilutions.

5.5.7 Special Instructions for Computing and Reporting E. coli for LT2 Samples:

5.5.7.1 Since three different volumes (100 mL, 10, mL and 1.0 mL) of the same sample, the volume that yields the number of positive wells (# of Large Wells + # of Small Wells) in the countable range of 39 to 78 (40 to 80%) is the one that is to be used for reporting.

5.5.8 Record the date reported in the "Rpt Date" column and the initials of the analysts reading the results in the "Initials." column. Also, record the time the samples are read in the space to the right of the last column labeled "Read Time".

Note: The report date, analysts initials and time read may be recorded on the top line and then arrows drawn down. See example on Attachment #1.

5.5.9 After the data has been entered on the bench sheet for a particular sample then the Water Bacteriological Report Form (EM-1) is to be completed. Total Coliforms are to be marked as "Present" or "Absent". *E. coli* only has to be marked as "Present" or "Absent" if Total Coliforms are Present. The MPN value for total coliforms and *E. coli* is to then be recorded in the "_____ per 100 mL" space.

5.5.10 After all EM-1 forms are marked, they are to be placed in the basket labeled "Forms To Be Checked".

5.5.11 All forms are to be checked by a Microbiologist II or higher. All samples with Total Coliform Positive Results must be initialed by the analyst checking them on the bench sheet. Initials are to be placed to the right of the initials of the analyst reading the test. (See Attachment #1).

6.0 Quality Control

6.1 Colilert Quality Control

6.1.1 See procedure Chromogenic/Fluorogenic Substrate Test (Colilert 100 mL), Section VI.

6.2 Additional Quality Control for the Quanti Tray:

6.2.1 On a monthly basis, add 100 mL of a bromcresol purlple solution to a 97 well tray and seal. Check for any leaks and record the results on the "Quanti Tray Sealer - Leak Check" form (Attachment #3)

Attachment #1
Colilert Bench Sheet

BENCH SHEET- COLILERT

Lab Sample	Code	County	Collect Dt	Analysis Dt	Name/Co	Collector	Sample Lo	Conf24	E. coli	Total Coliform	E. Coli	Rpt Date	Initials	Read Time
46467	3A	MASON	10/16/2006	10/17/2006		HITE	HAMBRICK					10/18	DP	12:20 pm
46468	3A	ROANE	10/16/2006	10/17/2006		PARSONS	THRIFTWA							
46469	3A	MASON	10/16/2006	10/17/2006		HITE	WALNUT C							
46470	8I	PUTNAM	10/16/2006	10/17/2006		LYONS	PLANT	49/29	8/0	5794	218			cm
46471	3A	PUTNAM	10/16/2006	10/17/2006		LYONS	WINFIELD							
46472	3A	PUTNAM	10/16/2006	10/17/2006		LYONS	1401 HOSP							
46473	8I	PUTNAM	10/16/2006	10/17/2006		LYONS	PLANT	49/30	2/3	6131	365			cm
46474	3A	PUTNAM	10/16/2006	10/17/2006		LYONS	ELANOR E							
46475	3A	PUTNAM	10/16/2006	10/17/2006		LYONS	J'S HILLYBI							
46476	3A	PUTNAM	10/16/2006	10/17/2006		LYONS	BUFFALO E							
46477	3A	PUTNAM	10/16/2006	10/17/2006		LYONS	MCDONAL							
46478	3A	FAYETTE	10/16/2006	10/17/2006		BLAKE	PUBLIC RE							
46479	3A	JACKSON	10/16/2006	10/17/2006		KV	END GOSH							
46480	3A	MASON	10/16/2006	10/17/2006		HITE	APPLE GR							
46481	3A	WYOMING	10/16/2006	10/17/2006		ENGLAND	MAINT SHO							
46482	3A	WYOMING	10/16/2006	10/17/2006		SB	KIT							
46483	3A	FAYETTE	10/16/2006	10/17/2006		BLAKE	WATER PL							
46484	3A	ROANE	10/16/2006	10/17/2006		PARSONS	ABBOTTS							
46485	3B	MASON	10/16/2006	10/17/2006		WAUGH	CAMPGRO	1	-	P	A			cm
46486	3A	MASON	10/16/2006	10/17/2006		HITE	SADDLE C	1	-	P	A			cm
46487	3A	MASON	10/16/2006	10/17/2006		HITE	SADDLE C							
46488	3A	ROANE	10/16/2006	10/17/2006		STARCHER	STATION BI							
46489	3A	MERCER	10/16/2006	10/17/2006		BELCHER	PONY FAR							
46490	3A	MERCER	10/16/2006	10/17/2006		BELCHER	WWTP							
46491	3A	MERCER	10/16/2006	10/17/2006		BELCHER	RYAN VILL							
46492	3A	LOGAN	10/16/2006	10/17/2006		MOUNTS	PAT BROW							
46493	3A	LOGAN	10/16/2006	10/17/2006		MOUNTS	M&M DAIR							

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Note: "Name/Co" have been hidden to protect privacy.

Attachment #2

IDEXX Quanti-Tray®/2000 MPN Table (per 100ml)

# Large Wells Positive	# Small Wells Positive																							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	<1	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.1	15.1	16.1	17.1	18.1	19.1	20.2	21.2	22.2	23.3	24.3
1	1.0	2.0	3.0	4.0	5.0	6.0	7.1	8.1	9.1	10.1	11.1	12.1	13.2	14.2	15.2	16.2	17.3	18.3	19.3	20.4	21.4	22.4	23.5	24.5	25.6
2	2.0	3.0	4.1	5.1	6.1	7.1	8.1	9.2	10.2	11.2	12.2	13.3	14.3	15.4	16.4	17.4	18.5	19.5	20.6	21.6	22.7	23.7	24.8	25.8	26.9
3	3.1	4.1	5.1	6.1	7.2	8.2	9.2	10.3	11.3	12.4	13.4	14.5	15.5	16.5	17.6	18.6	19.7	20.8	21.8	22.9	23.9	25.0	26.1	27.1	28.2
4	4.1	5.2	6.2	7.2	8.3	9.3	10.4	11.4	12.5	13.5	14.6	15.6	16.7	17.8	18.8	19.9	21.0	22.0	23.1	24.2	25.3	26.3	27.4	28.5	29.6
5	5.2	6.3	7.3	8.4	9.4	10.5	11.5	12.6	13.7	14.7	15.8	16.9	17.9	19.0	20.1	21.2	22.2	23.3	24.4	25.5	26.6	27.7	28.8	29.9	31.0
6	6.3	7.4	8.4	9.5	10.6	11.6	12.7	13.8	14.9	16.0	17.0	18.1	19.2	20.3	21.4	22.5	23.6	24.7	25.8	26.9	28.0	29.1	30.2	31.3	32.4
7	7.5	8.5	9.6	10.7	11.8	12.9	13.9	15.0	16.1	17.2	18.3	19.4	20.5	21.6	22.7	23.8	24.9	26.0	27.1	28.3	29.4	30.5	31.6	32.8	33.9
8	8.6	9.7	10.8	11.9	13.0	14.1	15.2	16.3	17.4	18.5	19.6	20.7	21.8	22.9	24.1	25.2	26.3	27.4	28.6	29.7	30.8	32.0	33.1	34.3	35.4
9	9.8	10.9	12.0	13.1	14.2	15.3	16.4	17.6	18.7	19.8	20.9	22.0	23.2	24.3	25.4	26.6	27.7	28.9	30.0	31.2	32.3	33.5	34.6	35.8	37.0
10	11.0	12.1	13.2	14.4	15.5	16.6	17.7	18.9	20.0	21.1	22.3	23.4	24.6	25.7	26.9	28.0	29.2	30.3	31.5	32.7	33.8	35.0	36.2	37.4	38.6
11	12.2	13.4	14.5	15.6	16.8	17.9	19.1	20.2	21.4	22.5	23.7	24.8	26.0	27.2	28.3	29.5	30.7	31.9	33.0	34.2	35.4	36.6	37.8	39.0	40.2
12	13.5	14.6	15.8	16.9	18.1	19.3	20.4	21.6	22.8	23.9	25.1	26.3	27.5	28.6	29.8	31.0	32.2	33.4	34.6	35.8	37.0	38.2	39.5	40.7	41.9
13	14.8	16.0	17.1	18.3	19.5	20.6	21.8	23.0	24.2	25.4	26.6	27.8	29.0	30.2	31.4	32.6	33.8	35.0	36.2	37.5	38.7	39.9	41.2	42.4	43.6
14	16.1	17.3	18.5	19.7	20.9	22.1	23.3	24.5	25.7	26.9	28.1	29.3	30.5	31.7	33.0	34.2	35.4	36.7	37.9	39.1	40.4	41.6	42.9	44.2	45.4
15	17.5	18.7	19.9	21.1	22.3	23.5	24.7	25.9	27.2	28.4	29.6	30.9	32.1	33.3	34.6	35.8	37.1	38.4	39.6	40.9	42.2	43.4	44.7	46.0	47.3
16	18.9	20.1	21.3	22.6	23.8	25.0	26.2	27.5	28.7	30.0	31.2	32.5	33.7	35.0	36.3	37.5	38.8	40.1	41.4	42.7	44.0	45.3	46.6	47.9	49.2
17	20.3	21.6	22.8	24.1	25.3	26.6	27.8	29.1	30.3	31.6	32.9	34.1	35.4	36.7	38.0	39.3	40.6	41.9	43.2	44.5	45.9	47.2	48.5	49.8	51.2
18	21.8	23.1	24.3	25.6	26.9	28.1	29.4	30.7	32.0	33.3	34.6	35.9	37.2	38.5	39.8	41.1	42.4	43.8	45.1	46.5	47.8	49.2	50.5	51.9	53.2
19	23.3	24.6	25.9	27.2	28.5	29.8	31.1	32.4	33.7	35.0	36.3	37.6	39.0	40.3	41.6	43.0	44.3	45.7	47.1	48.4	49.8	51.2	52.6	54.0	55.4
20	24.9	26.2	27.5	28.8	30.1	31.5	32.8	34.1	35.4	36.8	38.1	39.5	40.8	42.2	43.6	44.9	46.3	47.7	49.1	50.5	51.9	53.3	54.7	56.1	57.6
21	26.5	27.9	29.2	30.5	31.8	33.2	34.5	35.9	37.3	38.6	40.0	41.4	42.8	44.1	45.5	46.9	48.4	49.8	51.2	52.6	54.1	55.5	56.9	58.4	59.9
22	28.2	29.5	30.9	32.3	33.6	35.0	36.4	37.7	39.1	40.5	41.9	43.3	44.8	46.2	47.6	49.0	50.5	51.9	53.4	54.8	56.3	57.8	59.3	60.8	62.3
23	29.9	31.3	32.7	34.1	35.5	36.8	38.3	39.7	41.1	42.5	43.9	45.4	46.8	48.3	49.7	51.2	52.7	54.2	55.6	57.1	58.6	60.2	61.7	63.2	64.7
24	31.7	33.1	34.5	35.9	37.3	38.8	40.2	41.7	43.1	44.6	46.0	47.5	49.0	50.5	52.0	53.5	55.0	56.5	58.0	59.5	61.1	62.6	64.2	65.8	67.3
25	33.6	35.0	36.4	37.9	39.3	40.8	42.2	43.7	45.2	46.7	48.2	49.7	51.2	52.7	54.3	55.8	57.3	58.9	60.5	62.0	63.6	65.2	66.8	68.4	70.0
26	35.5	36.9	38.4	39.9	41.4	42.8	44.3	45.9	47.4	48.9	50.4	52.0	53.5	55.1	56.7	58.2	59.8	61.4	63.0	64.7	66.3	67.9	69.6	71.2	72.9
27	37.4	38.9	40.4	42.0	43.5	45.0	46.5	48.1	49.6	51.2	52.8	54.4	56.0	57.6	59.2	60.8	62.4	64.1	65.7	67.4	69.1	70.8	72.5	74.2	75.9
28	39.5	41.0	42.6	44.1	45.7	47.3	48.8	50.4	52.0	53.6	55.2	56.9	58.5	60.2	61.8	63.5	65.2	66.9	68.6	70.3	72.0	73.7	75.5	77.3	79.0
29	41.7	43.2	44.8	46.4	48.0	49.6	51.2	52.8	54.5	56.1	57.8	59.6	61.2	62.9	64.6	66.3	68.0	69.8	71.5	73.3	75.1	76.9	78.7	80.5	82.4
30	43.9	45.5	47.1	48.7	50.4	52.0	53.7	55.4	57.1	58.8	60.5	62.2	64.0	65.7	67.5	69.3	71.0	72.9	74.7	76.5	78.3	80.2	82.1	84.0	85.9
31	46.2	47.9	49.5	51.2	52.9	54.6	56.3	58.1	59.8	61.6	63.3	65.1	66.9	68.7	70.5	72.4	74.2	76.1	78.0	79.9	81.8	83.7	85.7	87.6	89.6
32	48.7	50.4	52.1	53.8	55.6	57.3	59.1	60.9	62.7	64.5	66.3	68.2	70.0	71.9	73.8	75.7	77.6	79.5	81.5	83.5	85.4	87.5	89.5	91.5	93.5
33	51.2	53.0	54.8	56.5	58.3	60.2	62.0	63.8	65.7	67.6	69.5	71.4	73.3	75.2	77.2	79.2	81.2	83.2	85.2	87.3	89.3	91.4	93.6	95.7	97.5
34	53.9	55.7	57.6	59.4	61.3	63.1	65.0	67.0	68.9	70.8	72.8	74.8	76.8	78.8	80.8	82.9	85.0	87.1	89.2	91.4	93.5	95.7	97.9	100.2	102.4
35	56.8	58.6	60.5	62.4	64.4	66.3	68.3	70.3	72.3	74.3	76.3	78.4	80.5	82.6	84.7	86.9	89.1	91.3	93.5	95.7	98.0	100.3	102.6	105.0	107.3
36	59.8	61.7	63.7	65.7	67.7	69.7	71.7	73.8	75.9	78.0	80.1	82.3	84.5	86.7	88.9	91.2	93.5	95.8	98.1	100.5	102.9	105.3	107.7	110.2	112.7
37	62.9	65.0	67.0	69.1	71.2	73.3	75.4	77.6	79.8	82.0	84.2	86.5	88.8	91.1	93.4	95.8	98.2	100.6	103.1	105.6	108.1	110.7	113.3	115.9	118.6
38	66.3	68.4	70.6	72.7	74.9	77.1	79.4	81.6	83.9	86.2	88.6	91.0	93.4	95.8	98.3	100.8	103.4	105.9	108.6	111.2	113.9	116.6	119.4	122.2	125.0
39	70.0	72.2	74.4	76.7	78.9	81.3	83.6	86.0	88.4	90.9	93.4	95.9	98.4	101.0	103.6	106.3	109.0	111.8	114.6	117.4	120.3	123.2	126.1	129.2	132.2
40	73.8	76.2	78.5	80.9	83.3	85.7	88.2	90.6	93.3	95.9	98.6	101.2	103.9	106.7	109.5	112.4	115.3	118.2	121.2	124.3	127.4	130.6	133.7	137.0	140.3
41	78.0	80.5	83.0	85.5	88.0	90.6	93.3	95.9	98.7	101.4	104.3	107.1	110.0	113.0	116.0	119.1	122.2	125.4	128.7	132.0	135.4	138.8	142.3	145.9	149.5
42	82.6	85.2	87.8	90.5	93.2	96.0	98.8	101.7	104.6	107.6	110.6	113.7	116.9	120.1	123.4	126.7	130.1	133.6	137.2	140.8	144.5	148.3	152.2	156.1	160.2
43	87.6	90.4	93.2	96.0	99.0	101.9	105.0	108.1	111.2	114.5	117.8	121.1	124.6	128.1	131.7	135.4	139.1	143.0	147.0	151.0	155.2	159.4	163.8	168.2	172.8
44	93.1	96.1	99.1	102.2	105.4	108.6	111.9	115.3	118.7	122.3	125.9	129.6	133.4	137.4	141.4	145.5	149.7	154.1	158.5	163.1	167.9	172.7	177.7	182.9	188.2
45	99.3	102.5	105.8	109.2	112.6	116.2	119.8	123.6	127.4	131.4	135.4	139.6	143.9	148.3	152.9	157.6	162.4	167.4	172.6	178.0	183.5	189.2	195.1	201.2	207.5
46	106.3	109.8	113.4	117.2	121.0	125.0	129.1	133.3	137.6	142.1	146.7	151.5	156.5	161.6	167.0	172.5	178.2	184.2	190.4	196.8	203.5	210.5	217.8	225.4	233.3
47	114.3	118.3	122.4	126.6	130.9	135.4	140.1	145.0	150.0	155.3	160.7	166.4	172.3	178.5	185.0	191.6	198.9	206.4	214.2	222.4	231.0	240.0	249.5	259.5	270.0
48	123.9	128.4	133.1	137.9	143.0	148.3	153.9	159.7	165.8	172.2	178.9	186.0	193.5	201.4	209.8	218.7	228.2	238.2	248.9	260.3	272.3	285.1	298.7	313.0	328.2
49	135.5	140.9	146.4	152.3	158.5	165.0	172.0	179.3	187.2	195.6	204.6	214.3	224.7	235.9	248.1	261.3	275.5	290.9	307.6	325.6	344.8	365.4	387.3	410.6	435.2

99-63235-01

IDEXX Quanti-Tray®/2000 MPN Table (per 100ml)

# Large Wells Positive	# Small Wells Positive																							
	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
0	25.3	26.4	27.4	28.4	29.5	30.5	31.5	32.6	33.6	34.7	35.7	36.8	37.8	38.9	40.0	41.0	42.1	43.1	44.2	45.3	46.2	47.4	48.5	49.5
1	26.6	27.7	28.7	29.8	30.8	31.9	32.9	34.0	35.0	36.1	37.2	38.2	39.3	40.4	41.4	42.5	43.6	44.7	45.7	46.8	47.9	49.0	50.1	51.2
2	27.9	29.0	30.0	31.1	32.2	33.2	34.3	35.4	36.5	37.5	38.6	39.7	40.8	41.9	43.0	44.0	45.1	46.2	47.3	48.4	49.5	50.6	51.7	52.8
3	29.3	30.4	31.4	32.5	33.6	34.7	35.8	36.8	37.9	39.0	40.1	41.2	42.3	43.4	44.5	45.6	46.7	47.8	49.0	50.0	51.2	52.3	53.4	54.5
4	30.7	31.8	32.8	33.9	35.0	36.1	37.2	38.3	39.4	40.5	41.6	42.8	43.9	45.0	46.1	47.2	48.3	49.5	50.6	51.7	52.9	54.0	55.1	56.3
5	32.1	33.2	34.3	35.4	36.5	37.6	38.7	39.9	41.0	42.1	43.2	44.4	45.5	46.6	47.7	48.9	50.0	51.2	52.3	53.5	54.6	55.8	56.9	58.1
6	33.5	34.7	35.8	36.9	38.0	39.2	40.3	41.4	42.6	43.7	44.9	46.0	47.1	48.3	49.4	50.6	51.7	52.9	54.1	55.2	56.4	57.6	58.7	59.9
7	35.0	36.2	37.3	38.4	39.6	40.7	41.9	43.0	44.2	45.3	46.5	47.7	48.8	50.0	51.2	52.3	53.5	54.7	55.9	57.1	58.3	59.4	60.6	61.8
8	36.6	37.7	38.9	40.0	41.2	42.3	43.5	44.7	45.9	47.0	48.2	49.4	50.6	51.8	53.0	54.1	55.3	56.5	57.7	59.0	60.2	61.4	62.6	63.8
9	38.1	39.3	40.5	41.6	42.8	44.0	45.2	46.4	47.6	48.8	50.0	51.2	52.4	53.6	54.9	56.0	57.2	58.4	59.7	60.9	62.1	63.4	64.6	65.8
10	39.7	40.9	42.1	43.3	44.5	45.7	46.9	48.1	49.3	50.6	51.8	53.0	54.2	55.5	56.7	57.9	59.2	60.4	61.7	62.9	64.2	65.4	66.7	67.9
11	41.4	42.6	43.8	45.0	46.3	47.5	48.7	49.9	51.2	52.4	53.7	54.9	56.1	57.4	58.6	59.9	61.2	62.4	63.7	65.0	66.3	67.5	68.8	70.1
12	43.1	44.3	45.6	46.8	48.1	49.3	50.6	51.8	53.1	54.3	55.6	56.9	58.1	59.4	60.7	62.0	63.2	64.5	65.8	67.1	68.4	69.7	71.0	72.4
13	44.9	46.1	47.4	48.6	49.9	51.2	52.5	53.7	55.0	56.3	57.6	58.9	60.2	61.5	62.9	64.1	65.4	66.7	68.0	69.3	70.7	72.0	73.3	74.7
14	46.7	48.0	49.3	50.5	51.8	53.1	54.4	55.7	57.0	58.3	59.6	60.9	62.3	63.6	64.9	66.3	67.6	68.9	70.3	71.6	73.0	74.4	75.7	77.1
15	48.6	49.9	51.2	52.5	53.8	55.1	56.4	57.8	59.1	60.4	61.8	63.1	64.5	65.8	67.2	68.5	69.9	71.3	72.6	74.0	75.4	76.8	78.2	79.6
16	50.5	51.9	53.2	54.6	55.8	57.2	58.5	59.9	61.2	62.6	64.0	65.3	66.7	68.1	69.5	70.9	72.3	73.7	75.1	76.5	77.9	79.3	80.8	82.2
17	52.5	53.9	55.2	56.6	58.0	59.3	60.7	62.1	63.5	64.9	66.3	67.7	69.1	70.5	71.9	73.3	74.8	76.2	77.6	79.1	80.5	82.0	83.5	84.9
18	54.6	56.0	57.4	58.8	60.2	61.6	63.0	64.4	65.8	67.2	68.6	70.1	71.5	73.0	74.4	75.9	77.3	78.8	80.3	81.8	83.3	84.8	86.3	87.8
19	56.8	58.2	59.6	61.0	62.4	63.9	65.3	66.8	68.2	69.7	71.1	72.6	74.1	75.5	77.0	78.5	80.0	81.5	83.1	84.6	86.1	87.6	89.2	90.7
20	59.0	60.4	61.9	63.3	64.8	66.3	67.7	69.2	70.7	72.2	73.7	75.2	76.7	78.2	79.8	81.3	82.8	84.4	85.9	87.5	89.1	90.7	92.2	93.8
21	61.3	62.8	64.3	65.8	67.3	68.8	70.3	71.8	73.3	74.9	76.4	77.9	79.5	81.1	82.6	84.2	85.8	87.4	89.0	90.6	92.2	93.8	95.4	97.1
22	63.8	65.3	66.8	68.3	69.8	71.4	72.9	74.5	76.1	77.6	79.2	80.8	82.4	84.0	85.6	87.2	88.9	90.5	92.1	93.8	95.5	97.1	98.8	100.5
23	66.3	67.9	69.4	71.0	72.5	74.1	75.7	77.3	78.9	80.5	82.2	83.8	85.4	97.1	88.7	90.4	92.1	93.8	95.5	97.2	99.0	100.6	102.4	104.1
24	68.9	70.5	72.1	73.7	75.3	77.0	78.6	80.3	81.9	83.6	85.2	86.9	88.6	90.3	92.0	93.8	95.5	97.2	99.0	100.7	102.5	104.3	106.1	107.9
25	71.7	73.3	75.0	76.6	78.3	80.0	81.7	83.3	85.1	86.8	88.5	90.2	92.0	93.7	95.5	97.3	99.1	100.9	102.7	104.5	106.3	108.2	110.0	111.9
26	74.6	76.3	78.0	79.7	81.4	83.1	84.8	86.6	88.4	90.1	91.9	93.7	95.5	97.3	99.2	101.0	102.9	104.7	106.6	108.5	110.4	112.3	114.2	116.2
27	77.6	79.4	81.1	82.9	84.6	86.4	88.2	90.0	91.9	93.7	95.5	97.4	99.3	101.2	103.1	105.0	106.9	108.8	110.8	112.7	114.7	116.7	118.7	120.7
28	80.8	82.6	84.4	86.3	88.1	89.9	91.8	93.7	95.6	97.5	99.4	101.3	103.3	105.2	107.2	109.2	111.2	113.2	115.2	117.3	119.3	121.4	123.5	125.6
29	84.2	86.1	87.9	89.8	91.7	93.7	95.6	97.5	99.5	101.5	103.5	105.5	107.5	109.5	111.6	113.7	115.7	117.8	120.0	122.1	124.2	126.4	128.6	130.8
30	87.9	89.7	91.7	93.6	95.6	97.6	99.6	101.6	103.7	105.7	107.8	109.9	112.0	114.2	116.3	118.5	120.6	122.8	125.1	127.3	129.5	131.8	134.1	136.4
31	91.6	93.6	95.6	97.7	99.7	101.8	103.9	106.0	108.2	110.3	112.5	114.7	116.9	119.1	121.4	123.6	125.9	128.2	130.5	132.9	135.3	137.7	140.1	142.5
32	95.7	97.8	99.9	102.0	104.2	106.3	108.5	110.7	113.0	115.2	117.5	119.8	122.1	124.5	126.8	129.2	131.6	134.0	136.5	139.0	141.5	144.0	146.6	149.1
33	100.0	102.2	104.4	106.6	108.9	111.2	113.5	115.8	118.2	120.5	122.9	125.4	127.8	130.3	132.8	135.3	137.8	140.4	143.0	145.6	148.3	150.9	153.7	156.4
34	104.7	107.0	109.3	111.7	114.0	116.4	118.9	121.3	123.8	126.3	128.8	131.4	134.0	136.6	139.2	141.9	144.6	147.4	150.1	152.9	155.7	158.6	161.6	164.4
35	109.7	112.2	114.6	117.1	119.6	122.2	124.7	127.3	129.9	132.6	135.3	138.0	140.8	143.6	146.4	149.2	152.1	155.0	158.0	161.0	164.0	167.1	170.2	173.3
36	115.2	117.8	120.4	123.0	125.7	128.4	131.1	133.9	136.7	139.5	142.4	145.3	148.3	151.3	154.3	157.3	160.5	163.6	166.8	170.0	173.3	176.6	179.9	183.3
37	121.3	124.0	126.8	129.6	132.4	135.3	138.2	141.2	144.2	147.3	150.3	153.5	156.7	159.9	163.1	166.5	169.8	173.2	176.7	180.2	183.7	187.3	191.0	194.7
38	127.9	130.8	133.8	136.8	139.9	143.0	146.2	149.4	152.6	155.9	159.2	162.6	166.1	169.6	173.2	176.9	180.4	184.2	188.0	191.8	195.7	199.7	203.7	207.7
39	135.3	138.5	141.7	145.0	148.3	151.7	155.1	158.6	162.1	165.7	169.4	173.1	176.9	180.7	184.7	188.7	192.7	196.8	201.0	205.3	209.6	214.0	218.5	223.0
40	143.7	147.1	150.6	154.2	157.8	161.5	165.3	169.1	173.0	177.0	181.1	185.2	189.4	193.7	198.1	202.5	207.1	211.7	216.4	221.1	226.0	231.0	236.0	241.1
41	153.2	157.0	160.9	164.8	168.9	173.0	177.2	181.5	185.8	190.3	194.8	199.5	204.2	209.1	214.0	219.1	224.2	229.4	234.8	240.2	245.8	251.5	257.2	263.1
42	164.3	168.6	172.9	177.3	181.9	186.5	191.3	196.1	201.1	206.2	211.4	216.7	222.2	227.7	233.4	239.2	245.2	251.3	257.5	263.8	270.3	276.9	283.6	290.5
43	177.5	182.3	187.3	192.4	197.6	202.9	208.4	214.0	219.8	225.8	231.8	238.1	244.5	251.0	257.7	264.6	271.7	278.9	286.3	293.8	301.5	309.4	317.4	325.7
44	193.6	199.3	205.1	211.0	217.2	223.5	230.0	236.7	243.6	250.8	258.1	265.6	273.3	281.2	289.4	297.8	306.3	315.1	324.1	333.3	342.9	352.4	362.3	372.4
45	214.1	220.9	227.9	235.2	242.7	250.4	258.4	266.7	275.3	284.1	293.3	302.6	312.3	322.3	332.5	343.0	353.9	364.9	376.2	387.9	399.8	412.0	424.5	437.4
46	241.5	250.0	258.9	268.2	277.8	287.8	298.1	308.8	319.9	331.4	343.3	355.5	368.1	381.1	394.5	408.3	422.5	437.1	452.0	467.4	483.3	499.6	516.3	533.5
47	280.9	292.4	304.4	316.9	330.0	343.6	357.8	372.6	387.7	403.4	419.8	436.6	454.1	472.1	490.7	509.9	529.8	550.4	571.7	593.8	616.7	640.5	665.2	691.0
48	344.1	360.9	378.4	396.8	416.0	436.0	456.9	478.6	501.2	524.7	549.3	574.8	601.5	629.4	658.6	689.3	721.5	755.6	791.5	829.7	870.4	913.9	960.6	1011.2
49	461.1	498.4	517.2	547.5	579.4	613.1	648.8	686.7	727.0	770.1	816.4	866.4	920.6	980.4	1046.2	1119.9	1203.3	1299.7	1413.6	1553.1	1732.9	1986.3	2419.6	>2419.6

09-63235-01

Attachment #3

QUANTI TRAY SEALER

LEAK CHECKS

Date	Sealer S/N (Model)	Observations	Q-Tray Lot #	Exp Date	Comments	Initials
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				
	☐ 145135 (2020) ☐ 01557 (2X)	☐ Okay – No Leaks ☐ Do Not Use – Leaks Detected				

On-Site Laboratory Evaluation Report (SDWA)

Date of Report: July 15, 2003

Microbiology

Environmental Microbiology Section
Office of Laboratory Services
Bureau for Public Health
West Virginia Department of Health and Human Services
167 11th Avenue
South Charleston, WV 25303

Date of Assessment: June 24-25, 2003

by

David E. Russell

U.S. Environmental Protection Agency, Region III
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, MD 20755-5350

A. Introduction:

On June 24-25, 2003, an evaluation of the Environmental Biology Section of the Office of Laboratory Services in Charleston, West Virginia, was conducted to determine the capability of the Laboratory to perform its mission as it relates to the Safe Drinking Water Act. The Laboratory was last evaluated in December 1999.

The Environmental Microbiology Section (hereafter, the Laboratory) is currently analyzing drinking water for total coliform and fecal coliform (or *Escherichia coli*) using Multiple Tube Fermentation (MTF) or Colilert. Although not performed routinely, the Laboratory also has the capability to analyze drinking water using Membrane Filtration (MF). In addition, Heterotrophic Plate Counts (HPC), using the pour plate method, are regularly performed, but not on drinking water compliance samples. The Laboratory wishes to maintain certification for all four methods: MTF, Colilert, MF, and HPC.

The Laboratory is to be congratulated for the record of PT sample analysis it has established over the past three years. In 2001, 2002, and 2003 the Laboratory successfully analyzed PT sample sets using the MTF, Colilert, and MF methods. All three methods were evaluated each year.

The equipment and procedures employed in the bacteriological analyses of drinking water by this laboratory conform with the provisions of the *Manual for the Certification of Laboratories Analyzing Drinking Water*, 4th Edition (1997, U.S. EPA, as corrected or amended by the Errata distributed November 18, 1998), except as described in Sections C and D below.

B. Personnel:

The following personnel currently analyze drinking water for total coliforms, fecal coliforms, (or *E.coli*), or heterotrophic plate count.

Tom Ong	Microbiologist Supervisor
Mike Flesher	Microbiologist III
Tracey Goodson	Microbiologist II
Joe Cochran	Microbiologist II
Debbie Walker	Laboratory Assistant II

The Assessors wish to thank these individuals for their willing assistance and cooperation during the on-site evaluation. Tom Ong was especially helpful and generous with his time.

C. General Findings:

General Findings include specific incidences of non-conformance with the equipment and analytical procedures required by the *Manual for the Certification of Laboratories Analyzing*

Drinking Water, 4th Edition (1997, U.S. EPA, as corrected or amended by the Errata distributed November 18, 1998), or laboratory procedures that, in the opinion of the assessor, jeopardize the generation of valid data.

There are no General Findings.

D. Recommendations:

The following remarks are offered as suggestions to help improve the quality and integrity of the data the Laboratory generates. Note that all paragraph numbers and quotes are from Chapter V of the *Manual for the Certification of Laboratories Analyzing Drinking Water*, 4th Edition (1997, U.S. EPA) unless otherwise indicated.

1. The Federal Register (40 CFR 74(a)(1) footnote 2) requires that source water collected for analysis for total coliforms, fecal coliforms, or HPC must be held below 10°C in transit and analysis must be initiated within 8 hours. The difficulty here lies in determining whether or not the source water samples are true "compliance" samples, a designation that would make meeting the above conditions mandatory. It is strongly recommended that the Laboratory always error on the side of producing scientifically and legally defensible data, and accordingly, treat all source or raw water samples as "compliance" samples. Therefore, whether raw samples are marked as "compliance" samples or not, if either condition above (<10°C or 8 hour holding time) is not met, the results should be flagged as "Not Valid for SDWA Compliance Reporting". At the time of the on-site visit, the Microbiology Supervisor agreed to this procedural change, and immediately informed staff of the new procedure.

2. The Federal Register (40 CFR 141.21(f)(3) footnote 2) in regard to the collection of drinking water samples from distribution systems, states, "Systems are encouraged but not required to hold samples below 10°C during transit." Accordingly, it is recommended that distribution system samples be held below 10°C during transit and that this condition be documented through the use of a temperature blank, the temperature of which would be determined upon arrival at the Laboratory and recorded.

3. The autoclave quality control and maintenance records detailed in paragraph 3.5.3 should be clearly associated with a specific identifiable autoclave. Suggest clearly labeling autoclaves with numbers and recording the autoclave numbers with all quality control and maintenance data.

4. Although the current record of spore strips used in the quality control of autoclaves (paragraph 3.5.4) shows the results for both the test and control strips, they are not clearly labeled as such. The table could be easily improved by enlarging it and adding labels.

5. Paragraph 8.4.3 specifies "person(s) responsible for performing analysis" as one of the

information items that should be included in laboratory records. The Laboratory's media and dilution water final pH values are recorded in the media prep log by taping the pH meter printout onto a separate logbook page. This represents a separate record of media QC data, and as such, should be initialed by the analyst in order to introduce more accountability into this QC record. The only other analyst initials in this logbook are those initials on the autoclave performance printout taped to other pages. The autoclave record, media prep record, and final pH record, are not always entered into the logbook by the same person, underscoring the need for initials.

6. According to paragraph 3.4.1, incubator "thermometers should be placed on the top and bottom shelves of the use area". In the Laboratory's large free-standing Environette incubator, the two thermometers are on adjacent shelves. They should be on shelves well separated from one another (if not the top and bottom shelves) so as to provide a better representation of the incubator's internal temperature.

7. The record of QC for sterilization of sampling bottles should be organized by batch of bottles, with each batch occupying one line in the logbook. Such a system would allow for the appropriate corrective action to be taken when the QC check of sterilization (testing a single bottle from the batch) fails. The corrective would be to reprocess all the bottles in the batch. The addition of a "Comments" column in the logbook would allow space for recording the corrective action taken. If this QC record is kept by batch, then the corrective action can be easily carried out. An ideal process would involve recording all the bottle numbers in each batch, so the composition of each batch is always known.

8. It is recommended that positive and negative results of all laboratory quality control checks be recorded in the same way. Either as "present" or "absent", or "+" or "-" .

9. The log of the IDEXX bottle volume QC should show the actual volume measured and the initials of the person performing the QC. The procedure should involve filling the IDEXX bottle to the 100ml mark, then pouring that volume into the class "A"graduated cylinder to determine the actual volume represented. A tolerance of plus or minus 2.5% is allowed. Alternatively, the bottle volume could be checked by weighing a bottle filled to the 100ml mark (100mls will weigh 100gs). The weighing technique would allow one to record accurately a value exceeding 100ml, whereas the use of a graduated cylinder does not.

10. IDEXX bottles loaded with sodium thiosulfate are not necessary because sufficient thiosulfate is added to sample bottles when they are prepared. IDEXX bottles without the sodium thiosulfate are much less expensive. If the IDEXX bottles are ever used as sample bottles, then they must contain the sodium thiosulfate.

11. Paragraph 4.3.2 (as amended by the Errata distributed 11/18/98) states that the regular QC of the laboratory reagent water should include the Bacteriological Quality test (annually) if the water does not meet the criteria of Type II reagent water as described in *Standard Methods*

for the Examination of Water and Wastewater, 18th Edition, Section 1080). Those criteria include a conductivity below 1.0 umho/cm @ 25°C. The conductivity of the Laboratory reagent water is above 1.0 umho/cm @ 25°C several times each year, indicating it does not meet the requirement for Type II water. Consequently it is recommended, in accordance with paragraph 4.3.2, that the Bacteriological Quality test (or "Suitability Test") be performed annually.

12. Currently, sample receipt and analysis data is recorded on three different forms with no one form containing all the information. The three forms are 1) the Water Bacteriological Report, 2) printout of spreadsheet kept in three-ring binders, and 3) final spreadsheet, not printed, but stored in the computer. This record could be improved by consolidating this information into one complete record, containing, as specified in paragraph 8.4, the times analyses are begun and ended. The new form from the engineering division may improve the situation but not represent the best solution.

13. The laboratory should be commended for the effort it is making to record the times associated with the analysis of drinking water, e.g., time sample analysis initiated or results read. The lack of this documentation was a concern included in the 1999 on-site visit report. These times provide documentation that the correct procedures were followed adding to the legal defensibility of the data. It is recommended that the laboratory include all times documenting that the correct procedures were followed, including the times at which initial and subsequent analyses are begun and results read.

14. It is recommended that the neutralization of the residual chlorine of finished drinking water samples be checked routinely. A randomly-selected portion of these samples each month (e.g., 10%) should be tested with a drop of iodine solution for excess sodium thiosulfate which will be present if all residual chlorine was neutralized. The iodine drop test could be easily performed (by a second analyst) on the sample water remaining in the collection bottle once the 100 mL test volume was removed. The sodium thiosulfate reacts with the iodine to produce sodium tetrathionate and sodium iodide both of which are colorless; consequently, the amber color produce by the drop of iodine quickly disappears. If sodium thiosulfate is not present the amber color remains.

15. The Laboratory should be commended for revising the Water Bacteriological Report form to include a check box labeled "NOT VALID FOR SDWA COMPLIANCE REPORTING". It is suggested that in a future revision of the form, check boxes for the reasons a report might not be valid for SDWA reporting be included. Those reasons would include exceeding holding time, failure to ship samples at less than 10°C (source water for any analysis or finished water for HPC), and collection of compliance samples by individuals not authorized to do so. Something similar already exists on the form to explain why samples were rejected and not examined. Such explanation serves to inform those who submit samples.

16. It is recommended that the Laboratory continue to participate in the training of samplers,

particularly in the completion of the Water Bacteriological Report form. Several hundred completed forms from 2002 and 2003 were examined by the assessor. One of the most common errors in completion of the form was the sampler's failure to indicate the type of sample collected. This occurred on sample numbers 011281, 011190, 011072, and 010943, all collected in Kanawha County in early 2003.

17. The Environmental Microbiology Quality Assurance Plan (latest revision date 5/17/00) was reviewed. The QAP does not reflect changes in laboratory procedures that have been implemented as a result of the 1999 on-site evaluation. For example, the laboratory now uses a unique identifying number on each sample bottle to link sample collection data to the sample, yet the QAP does not describe this procedure. The QAP should be updated to include all changes in procedure resulting from on-site assessments, past and present. Overall, the QAP should be updated periodically, at an interval specified in the document. It is further recommended that the clerical assistance necessary to keep the QAP up to date be provided to the Laboratory.

E. General Comments:

1. The Microbiology Supervisor is to be commended for the immediate steps taken to instruct staff to flag all source or raw water sample results as "Not Valid for SDWA Compliance Reporting" when such samples are not held below 10°C during transit or exceed the 8 hour holding time. This will be done whether it is known such samples are "compliance" samples or not.

2. Several important processes have been improved since the last on-site visit, including a) marking each sample bottle with a unique number and recording that number on the Water Bacteriological Report, b) documenting a demonstration of analytical competence for each new analyst, and c) tracking calibrations of thermometers by devoting a single log page to each thermometer. An atmosphere of continual improvement is evident at the Laboratory.

3. The Laboratory maintains detailed quality control records that includes data above and beyond that required by the SDWA manual. Examples include use of two max./min. thermometers with each autoclave run, bimonthly autoclave maintenance, and weekly spore strip testing of autoclave performance.

4. The Laboratory is to be commended for revising the Water Bacteriological Report form since the last on-site, incorporating all the requirements listed in paragraph 6.5, and adding a check box to be used when the test result is "NOT VALID FOR SDWA COMPLIANCE REPORTING". Review of records indicated that this check box is indeed used, particularly when the 30 hour holding time is exceeded, an occurrence that appears to happen only rarely.

5. The Laboratory is also to be commended for the routine practice of rejecting samples (without analysis) for exceeding the holding time, insufficient volume, insufficient

information on report form (such as collection date), unauthorized collector, residual chlorine, and insufficient air space to facilitate mixing.

F. Conclusions:

The Laboratory's management and staff are to be commended for their dedication to maintaining high standards in microbiological analysis and remaining committed to continual improvement. As shown in the table below, full certification will be recommended for Multiple-Tube Fermentation, Colilert, and Membrane Filtration. In accordance with 40 CFR 141.74, certification to perform total coliform analysis means the Laboratory is also certified to perform Heterotrophic Plate Counts (HPC).

G. Certification Status (Recommended by the Certification Officer):

Organisms	Technique	Method[1]	Certification Status
Total Coliforms, Fecal Coliforms (or *E. coli*)	Colilert	SM 9223	Full Certification
	Multiple Tube Fermentation	SM 9221B,E	Full Certification
	Membrane Filtration	SM 9222B	Full Certification
Heterotrophic Bacteria	Heterotrophic Plate Count	SM9215B	Full Certification

H. Assessor:

For D.R.
7/28/03

David E. Russell
Microbiological Assessor

[1] *Standard Methods for the Examination of Water and Wastewater*, 19th Edition.

'03

WV Dept. of Health & Human Resources
Bureau for Public Health
OFFICE OF LABORATORY SERVICES

Andrea Labik, Sc.D.
Director

Charlotte Billingsley, M.S.
Associate Director, P/T

Thomas L. Ong, Micro Supervisor*
Env. Microbiology Supervisor

Wayne Morganroth, Ph.D., Chem III*
Environmental Chemistry Supervisor

ENV. MICROBIOLOGY LAB
Mike Flesher, Micro III
Tracy Goodson, Micro II*, CO In-training
Joe Cochran, Micro II
Debbie Walker, Lab II

CHEMISTRY LAB
Larry Duffied, Chem II*
Gregory W. Young, Chem II

MEDIA, REAGENTS & GLASSWARE
Ron Releford, Lab III
Fred Pauley, Lab I

***SDWA Laboratory Certification Officer**

WV Dept. of Health & Human Resources
Bureau for Public Health
OFFICE OF ENV. HEALTH SERVICES
Public Health Sanitation (PHS)
- Collects Regulatory Check Samples from Public Water Systems
- Collects Water Samples for non SDWA Sources (Private Wells, Recreational Waters, Bottled Water, Dairy Farms & Plants, etc.)

Local County Health Depts.
- Collects Regulatory Check Samples from Public Water Systems
- Collects Water Samples from non SDWA Sources (Private Wells, Recreational Waters, Bottled Water, etc.)

Private Citizens
- Private Individual Wells

Engineering & Consulting Firms
- Collects Samples from work performed for Public & Private Water Systems

PUBLIC WATER SYSTEMS
- SDWA Samples Collected by Operators with at least a Class 1D License

WV Dept. of Health & Human Resources
Bureau For Public Health
OFFICE OF ENV. HEALTH SERVICES
Env. Engineering Division (EED)
- SDWA Regulatory Enforcement & Compliance
- Collects Regulatory Check Samples

SDWA SAMPLE ANALYSIS
NON SDWA SAMPLE COLLECTION
SDWA SAMPLE COLLECTION
Lab Administration & Support Svcs.

WATER BACTERIOLOGICAL REPORT | **COUNTY OF ORIGIN:** PUTNAM

REPORT TO BE CHARGED TO:

NAME: So. Putnam P.S.D.

ADDRESS: Po Box 147

CITY/STATE/ZIP: Scott Depot

NAME OF WATER SUPPLY

P.W.S. I.D. # 3 3 0 4 0 1 1

CODE

COLLECTOR: Cline Larck TITLE: Operator CERTIFICATION #: IF 1556

COLLECTORS ORGANIZATION: So. Putnam P.S.D. PHONE: 757-6551

SAMPLE TYPE:

- ☐ COMPLIANCE *(SDWA)*:
  - ☐ CWS ☐ NTNCWS ☐ TNCWS
- ☒ RAW *(DILUTIONS REQUIRED)*
  - ☐ SURFACE ☐ GROUND
- ☐ SPECIAL PURPOSE
- ☐ REPEAT FOR LAB#:_____
- ☐ REPLACEMENT FOR LAB#_____

- ☐ INDIVIDUAL HOUSEHOLD:
  - ☐ WELL ☐ CISTERN ☐ SPRING
  - IS SUPPLY PROTECTED? ☐ YES ☐ NO

- ☐ POOL
- ☐ BEACH
- ☐ BOTTLED WATER/ICE
- ☐ DAIRY FARM
- ☐ DAIRY PLANT
- ☐ OTHER:_____

REPORT TO BE MAILED TO:

NAME: South Putnam P.S.D.

ADDRESS: Po. Box 147

CITY/STATE/ZIP: Scott Depot WV 25560

BOTTLE NUMBER: 4267

SAMPLE COLLECTION:

DATE: 5/13/03 TIME: 7:35 ☑ AM ☐ PM

COLLECTOR'S INITIALS: CL

CHLORINATED ? ☐ YES ☑ NO RESIDUAL:____ ☐ TOTAL ☐ FREE

pH

SAMPLING POINT: LArcK

If NO Please

SAMPLE TRANSPORTATION: ☐ US MAIL ☐ UPS ☐ FEDEX ☐ AIRBORNE ☐ OTHER:_____

☐ HAND DELIVERED: ☐ BY COLLECTOR ☐ OTHER:_____

TRANSPORTATION CONDITION: ☐ PROTECTED FROM SUNLIGHT ☐ REFRIGERATED <10°C (50°F)

LAB NO. 012913 DATE REC'D MAY 13 03

METHOD OF ANALYSIS:

- ☐ MULTI TUBE FERMENTATION
- ☒ CHROMOGENIC FLUOROGENIC
- ☐ MEMBRANE FILTRATION
- ☐ HETEROTROPHIC PLATE COUNT

SAMPLE ANALYSIS:

DATE: 5-13-03

TIME: 1115 ☑ AM ☐ PM

ANALYSTS: TG

TEMP:_____ °C

TIME REC'D: 1115 ☑ AM ☐ PM

REC'D BY: TG TEMP_____ °C

☐ ***SAMPLES NOT EXAMINED DUE TO:**
- ☐ EXCEEDED TIME ☐ INSUFF. VOLUME
- ☐ INSUFF. INFO. ☐ UNAUTH. COLLECTOR
- ☐ CONTAINED RESIDUAL CHLORINE
- ☐ INSUFF. AIR SPACE TO FACILITATE MIXING

LABORATORY RESULTS:

TOTAL COLIFORMS:	☒ PRESENT	☐ ABSENT	95.4	PER 100 mL
FECAL COLIFORMS:	☐ PRESENT	☐ ABSENT		PER 100 mL
E. COLI:	☒ PRESENT	☐ ABSENT	1.1	PER 100 mL
FECAL STREPTOCOCCI:	☐ PRESENT	☐ ABSENT		PER 100 mL

HETEROTROPHIC PLATE COUNT: _____ CFU/mL

FECAL COLIFORM : FECAL STREPTOCOCCI RATIO:_____

☐ *INVALID DUE TO:
☐ TURBID ☐ COLOR INDETERMINATE ☐ TNTC ☐ CONFLUENT GROWTH ☐ PARTICULATE MATTER

☐ *LABORATORY ACCIDENT ***SEND REPLACEMENT SAMPLE**

MAY 14 03

REMARKS: ☐ REPORTED/☐ FAXED TO:_____

☒ NOT VALID FOR SDWA COMPLIANCE REPORTING

DATE REPORTED:

DIRECTOR:

WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES
BUREAU FOR PUBLIC HEALTH - OFFICE OF LABORATORY SERVICES
SO. CHARLESTON, WV 25303
KEARNEYSVILLE, WV 25430

WATER BACTERIOLOGICAL REPORT

COUNTY OF ORIGIN: MASON

REPORT TO BE CHARGED TO:

NAME:

ADDRESS:

CITY/STATE/ZIP:

NAME OF WATER SUPPLY: MASON Co. PSD - LAKIN

P.W.S. I.D. #: 3 3 0 2 7 1 2

CODE:

COLLECTOR: Koch TITLE: Engineer CERTIFICATION #:

COLLECTORS ORGANIZATION: OEHS PHONE: 722-0611

SAMPLE TYPE:

- ☐ COMPLIANCE *(SDWA)*:
  - ☐ CWS ☐ NTNCWS ☐ TNCWS
- ☒ RAW *(DILUTIONS REQUIRED)*
  - ☐ SURFACE ☒ GROUND
- ☒ SPECIAL PURPOSE Sanitary Survey
- ☐ REPEAT FOR LAB#:
- ☐ REPLACEMENT FOR LAB#

- ☐ INDIVIDUAL HOUSEHOLD:
  - ☐ WELL ☐ CISTERN ☐ SPRING
- IS SUPPLY PROTECTED?
  - ☐ YES ☐ NO

- ☐ POOL
- ☐ BEACH
- ☐ BOTTLED WATER/ICE
- ☐ DAIRY FARM
- ☐ DAIRY PLANT
- ☐ OTHER:

REPORT TO BE MAILED TO:

NAME: M. Koch

ADDRESS: 808 B St Suite G

CITY/STATE/ZIP: St Albans WV 25177

BOTTLE NUMBER: 3780

SAMPLE COLLECTION:

DATE: 3/12/03 TIME: 2: ☐ AM ☒ PM COLLECTOR'S INITIALS: MK

CHLORINATED ?
☐ YES ☒ NO RESIDUAL:____ ☐ TOTAL ☐ FREE

pH

SAMPLING POINT: Water Plant Raw Tap

SAMPLE TRANSPORTATION: ☐ US MAIL ☐ UPS ☐ FEDEX ☐ AIRBORNE ☐ OTHER:
☒ HAND DELIVERED: ☒ BY COLLECTOR ☐ OTHER:
TRANSPORTATION CONDITION:
☒ PROTECTED FROM SUNLIGHT ☐ REFRIGERATED <10°C (50°F)

LAB NO. DATE REC'D 010672 MAR 12 03

METHOD OF ANALYSIS:

- ☐ MULTI TUBE FERMENTATION
- ☒ CHROMOGENIC FLUOROGENIC
- ☒ MEMBRANE FILTRATION
- ☐ HETEROTROPHIC PLATE COUNT

SAMPLE ANALYSIS:

DATE: 3-12-03
TIME: 4 ☐ AM ☒ PM
ANALYSTS: DW
TEMP:____°C

TIME REC'D: 3:55 ☐ AM ☒ PM
REC'D BY: DW TEMP____°C

☐ *SAMPLES NOT EXAMINED DUE TO:
☐ EXCEEDED TIME ☐ INSUFF. VOLUME
☐ INSUFF. INFO. ☐ UNAUTH. COLLECTOR
☐ CONTAINED RESIDUAL CHLORINE
☐ INSUFF. AIR SPACE TO FACILITATE MIXING

LABORATORY RESULTS:

TOTAL COLIFORMS:	☐ PRESENT	☒ ABSENT	<1.0	PER 100 mL
FECAL COLIFORMS:	☐ PRESENT	☐ ABSENT		PER 100 mL
E. COLI:	☐ PRESENT	☒ ABSENT	<1.0	PER 100 mL
FECAL STREPTOCOCCI:	☐ PRESENT	☐ ABSENT		PER 100 mL

HETEROTROPHIC PLATE COUNT: _____ CFU/mL
FECAL COLIFORM : FECAL STREPTOCOCCI RATIO:_____
☐ *INVALID DUE TO:
☐ TURBID ☐ COLOR INDETERMINATE ☐ TNTC ☐ CONFLUENT GROWTH ☐ PARTICULATE MATTER
☐ *LABORATORY ACCIDENT ***SEND REPLACEMENT SAMPLE**

REMARKS: ☐ REPORTED/☐FAXED TO:
*Not valid for SDWA Compliance reporting

DATE REPORTED:

DIRECTOR:

WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES
BUREAU FOR PUBLIC HEALTH - OFFICE OF LABORATORY SERVICES
SO. CHARLESTON, WV 25303
KEARNEYSVILLE, WV 25430

WATER BACTERIOLOGICAL REPORT

COUNTY OF ORIGIN: Monroe

REPORT TO BE CHARGED TO:

NAME: S.S.V.W.Co

ADDRESS: 798 Rowan Road

CITY/STATE/ZIP: Gap Mills W.Va

NAME OF WATER SUPPLY: NOT COMPLIANCE

P.W.S. I.D. #: BW 5 4 9 2 0 0 6

CODE:

COLLECTOR: RALPH WICKLINE TITLE: Operator CERTIFICATION #: 9411

COLLECTORS ORGANIZATION: Bottled Water Plant PHONE: 772-3201

SAMPLE TYPE:

- ☐ COMPLIANCE *(SDWA)*:
  - ☐ CWS ☐ NTNCWS ☐ TNCWS
- ☑ RAW *(DILUTIONS REQUIRED)*
  - ☐ SURFACE ☐ GROUND
- ☐ SPECIAL PURPOSE
- ☐ REPEAT FOR LAB#: _____
- ☐ REPLACEMENT FOR LAB# _____

- ☐ INDIVIDUAL HOUSEHOLD:
  - ☐ WELL ☐ CISTERN ☑ SPRING
- IS SUPPLY PROTECTED?
  - ☐ YES ☐ NO

- ☐ POOL
- ☐ BEACH
- ☐ BOTTLED WATER/ICE
- ☐ DAIRY FARM
- ☐ DAIRY PLANT
- ☐ OTHER: RAW

REPORT TO BE MAILED TO:

NAME: Sweet Springs Valley Water Co

ADDRESS: 798 Rowan Road

CITY/STATE/ZIP: Gap Mills W.Va. 24941

BOTTLE NUMBER: 4972

SAMPLE COLLECTION:

DATE: 6/10/03 TIME: 7:00 ☑ AM ☐ PM

COLLECTOR'S INITIALS: RWJ

CHLORINATED ? O3 ☐ YES ☐ NO RESIDUAL: .3 ☐ TOTAL ☐ FREE

pH:

SAMPLING POINT: RAW H2O BB, Tanker Truck fill Spout

SAMPLE TRANSPORTATION: ☐ US MAIL ☐ UPS ☐ FEDEX ☐ AIRBORNE ☐ OTHER: _____

☐ HAND DELIVERED: ☐ BY COLLECTOR ☐ OTHER: _____

TRANSPORTATION CONDITION:

☐ PROTECTED FROM SUNLIGHT ☐ REFRIGERATED <10°C (50°F)

LAB NO. 014259 DATE REC'D

TIME REC'D: 9 ☑ AM ☐ PM

REC'D BY: TG MF TEMP _____ °C

METHOD OF ANALYSIS:

- ☐ MULTI TUBE FERMENTATION
- ☑ CHROMOGENIC/FLUOROGENIC
- ☐ MEMBRANE FILTRATION
- ☐ HETEROTROPHIC PLATE COUNT

SAMPLE ANALYSIS:

DATE: 6-11-03

TIME: 11 ☑ AM ☐ PM

ANALYSTS: MF

TEMP: _____ °C

☐ *SAMPLES NOT EXAMINED DUE TO:
- ☐ EXCEEDED TIME ☐ INSUFF. VOLUME
- ☐ INSUFF. INFO. ☐ UNAUTH. COLLECTOR
- ☐ CONTAINED RESIDUAL CHLORINE
- ☐ INSUFF. AIR SPACE TO FACILITATE MIXING

LABORATORY RESULTS:

TOTAL COLIFORMS:	☐ PRESENT	☑ ABSENT	<10 PER 100 mL
FECAL COLIFORMS:	☐ PRESENT	☐ ABSENT	_____ PER 100 mL
E. COLI:	☐ PRESENT	☐ ABSENT	_____ PER 100 mL
FECAL STREPTOCOCCI:	☐ PRESENT	☐ ABSENT	_____ PER 100 mL

HETEROTROPHIC PLATE COUNT: _____ CFU/mL

FECAL COLIFORM : FECAL STREPTOCOCCI RATIO: _____

☐ *INVALID DUE TO:
☐ TURBID ☐ COLOR INDETERMINATE ☐ TNTC ☐ CONFLUENT GROWTH ☐ PARTICULATE MATTER
☐ *LABORATORY ACCIDENT ***SEND REPLACEMENT SAMPLE**

REMARKS: ☐ REPORTED/☐ FAXED TO: _____

☐ NOT VALID FOR SDWA COMPLIANCE REPORTING

DATE REPORTED:

DIRECTOR:

WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES
BUREAU FOR PUBLIC HEALTH - OFFICE OF LABORATORY SERVICES
SO. CHARLESTON, WV 25303
KEARNEYSVILLE, WV 25430

WATER BACTERIOLOGICAL REPORT

COUNTY OF ORIGIN: Mason

REPORT TO BE CHARGED TO:

NAME: Mason Co. PSD

ADDRESS: 101 Camden Ave.

CITY/STATE/ZIP: Pt. Pleasant, WV 25550

NAME OF WATER SUPPLY: Lakin

P.W.S. I.D. # 3 3 0 2 7 1 2

CODE

COLLECTOR: C S Nute TITLE: Operator CERTIFICATION #: 4748

COLLECTORS ORGANIZATION: Mason Co. Pub. Svc. Dist. PHONE: 675-6399

SAMPLE TYPE:

- ☐ COMPLIANCE (SDWA): ☒ CWS ☐ NTNCWS ☐ TNCWS
- ☐ RAW (DILUTIONS REQUIRED) ☐ SURFACE ☒ GROUND
- ☒ SPECIAL PURPOSE
- ☐ REPEAT FOR LAB#:
- ☐ REPLACEMENT FOR LAB#

- ☐ INDIVIDUAL HOUSEHOLD: ☐ WELL ☐ CISTERN ☐ SPRING
- IS SUPPLY PROTECTED? ☐ YES ☐ NO

- ☐ POOL
- ☐ BEACH
- ☐ BOTTLED WATER/ICE
- ☐ DAIRY FARM
- ☐ DAIRY PLANT
- ☐ OTHER:

REPORT TO BE MAILED TO:

NAME: Mason County Pub. Svc. Dist.

ADDRESS: 101 Camden Avenue

CITY/STATE/ZIP: Pt. Pleasant, WV 25550

BOTTLE NUMBER: 4864

SAMPLE COLLECTION: DATE: 6/16/03 TIME: 14:30 ☐ AM ☒ PM COLLECTOR'S INITIALS: CSN

CHLORINATED? ☐ YES ☒ NO RESIDUAL: n/a ☐ TOTAL ☐ FREE

pH: 7.1

SAMPLING POINT: Well #2 (nca) G.W.U.D.I.

SAMPLE TRANSPORTATION: ☒ US MAIL ☐ UPS ☐ FEDEX ☐ AIRBORNE ☐ OTHER: ☐ HAND DELIVERED: ☐ BY COLLECTOR ☐ OTHER:

TRANSPORTATION CONDITION: ☐ PROTECTED FROM SUNLIGHT ☐ REFRIGERATED <10°C (50°F)

LAB NO. 014535 DATE REC'D JUN 17 03

TIME REC'D: 9 ☒ AM ☐ PM

REC'D BY: TGDW TEMP °C

METHOD OF ANALYSIS:

- ☐ MULTI TUBE FERMENTATION
- ☒ CHROMOGENIC/FLUOROGENIC
- ☐ MEMBRANE FILTRATION
- ☐ HETEROTROPHIC PLATE COUNT

SAMPLE ANALYSIS:

DATE: 6-17-03

TIME: 11 ☒ AM ☐ PM

ANALYSTS: DW

TEMP: °C

☐ *SAMPLES NOT EXAMINED DUE TO:
☐ EXCEEDED TIME ☐ INSUFF. VOLUME
☐ INSUFF. INFO. ☐ UNAUTH. COLLECTOR
☐ CONTAINED RESIDUAL CHLORINE
☐ INSUFF. AIR SPACE TO FACILITATE MIXING

LABORATORY RESULTS:

TOTAL COLIFORMS:	☐ PRESENT	☒ ABSENT	2 1.0	PER 100 mL
FECAL COLIFORMS:	☐ PRESENT	☐ ABSENT		PER 100 mL
E. COLI:	☐ PRESENT	☐ ABSENT		PER 100 mL
FECAL STREPTOCOCCI:	☐ PRESENT	☐ ABSENT		PER 100 mL

HETEROTROPHIC PLATE COUNT: CFU/mL

FECAL COLIFORM : FECAL STREPTOCOCCI RATIO:

JUN 19 03

☐ *INVALID DUE TO:
☐ TURBID ☐ COLOR INDETERMINATE ☐ TNTC ☐ CONFLUENT GROWTH ☐ PARTICULATE MATTER
☐ *LABORATORY ACCIDENT *SEND REPLACEMENT SAMPLE

REMARKS: ☐ REPORTED/☐ FAXED TO:

☒ NOT VALID FOR SDWA COMPLIANCE REPORTING

DATE REPORTED:

DIRECTOR:

WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES
BUREAU FOR PUBLIC HEALTH - OFFICE OF LABORATORY SERVICES
SO. CHARLESTON, WV 25303
KEARNEYSVILLE, WV 25430

WATER BACTERIOLOGICAL REPORT | **COUNTY OF ORIGIN:** PUTNAM

REPORT TO BE CHARGED TO:

NAME: So. PUTNAM P.S.D

ADDRESS: Po Box 147

CITY/STATE/ZIP: Scott Depot

NAME OF WATER SUPPLY

P.W.S. I.D. # 3 3 0 4 0 1 1

CODE

COLLECTOR: Clive Larck TITLE: Operator CERTIFICATION #: IF 1556

COLLECTORS ORGANIZATION: So. PUTNAM P.S.D. PHONE: 757-6551

SAMPLE TYPE:

- ☐ COMPLIANCE *(SDWA)*:
  - ☐ CWS ☐ NTNCWS ☐ TNCWS
- ☒ RAW *(DILUTIONS REQUIRED)*
  - ☒ SURFACE ☐ GROUND
- ☐ SPECIAL PURPOSE
- ☐ REPEAT FOR LAB#:_____
- ☐ REPLACEMENT FOR LAB#_____

- ☐ INDIVIDUAL HOUSEHOLD:
  - ☐ WELL ☐ CISTERN ☐ SPRING
  - IS SUPPLY PROTECTED? ☐ YES ☐ NO

- ☐ POOL
- ☐ BEACH
- ☐ BOTTLED WATER/ICE
- ☐ DAIRY FARM
- ☐ DAIRY PLANT
- ☐ OTHER:_____

REPORT TO BE MAILED TO:

NAME: SOUTH PUTNAM P.S.D.

ADDRESS: Po. Box 147

CITY/STATE/ZIP: Scott Depot WV 25560

BOTTLE NUMBER: 5073

SAMPLE COLLECTION: DATE: 3/19/03 TIME: ___:___ ☐ AM ☐ PM COLLECTOR'S INITIALS: CL

CHLORINATED ? ☐ YES ☐ NO RESIDUAL:____ ☐ TOTAL ☐ FREE

pH

SAMPLING POINT: LARCK If No Please

SAMPLE TRANSPORTATION: ☐ US MAIL ☐ UPS ☐ FEDEX ☐ AIRBORNE ☐ OTHER:_____

☐ HAND DELIVERED: ☐ BY COLLECTOR ☐ OTHER:_____

TRANSPORTATION CONDITION: ☐ PROTECTED FROM SUNLIGHT ☐ REFRIGERATED <10°C (50°F)

LAB NO. DATE REC'D 010922 MAR 19 03

METHOD OF ANALYSIS:

- ☐ MULTI TUBE FERMENTATION
- ☒ CHROMOGENIC FLUOROGENIC
- ☐ MEMBRANE FILTRATION
- ☐ HETEROTROPHIC PLATE COUNT

SAMPLE ANALYSIS:

DATE: 3-19-03

TIME: 1102 ☒ AM ☐ PM

ANALYSTS: DC

TEMP:_____°C

TIME REC'D: 10:30 ☒ AM ☐ PM

REC'D BY: DC TEMP_____°C

☐ ***SAMPLES NOT EXAMINED DUE TO:**
☐ EXCEEDED TIME ☐ INSUFF. VOLUME ☐ INSUFF. INFO. ☐ UNAUTH. COLLECTOR
☐ CONTAINED RESIDUAL CHLORINE ☐ INSUFF. AIR SPACE TO FACILITATE MIXING

LABORATORY RESULTS:

TOTAL COLIFORMS:	☒ PRESENT	☐ ABSENT	199	PER 100 mL
FECAL COLIFORMS:	☐ PRESENT	☒ ABSENT		PER 100 mL
E. COLI:	☐ PRESENT	☒ ABSENT	<10	PER 100 mL
FECAL STREPTOCOCCI:	☐ PRESENT	☐ ABSENT		PER 100 mL

HETEROTROPHIC PLATE COUNT:_____ CFU/mL

FECAL COLIFORM : FECAL STREPTOCOCCI RATIO:_____

☐ *INVALID DUE TO:
☐ TURBID ☐ COLOR INDETERMINATE ☐ TNTC ☐ CONFLUENT GROWTH ☐ PARTICULATE MATTER

☐ *LABORATORY ACCIDENT ***SEND REPLACEMENT SAMPLE**

MAR 21 03

REMARKS: ☐ REPORTED/☐FAXED TO:_____

☐ NOT VALID FOR SDWA COMPLIANCE REPORTING

DATE REPORTED:

DIRECTOR:

WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES
BUREAU FOR PUBLIC HEALTH - OFFICE OF LABORATORY SERVICES
SO. CHARLESTON, WV 25303
KEARNEYSVILLE, WV 25430

WATER BACTERIOLOGICAL REPORT

COUNTY OF ORIGIN: McDOWELL

REPORT TO BE CHARGED TO:

NAME: NORTHFORK WATER

ADDRESS: PO BOX 760

CITY/STATE/ZIP: NORTHFORK, WV 24868

NAME OF WATER SUPPLY: NORTHFORK

P.W.S. I.D. #: 3 3 0 2 4 1 3

CODE:

COLLECTOR: J. GRAHAM TITLE: OPERATOR CERTIFICATION #: 4882

COLLECTORS ORGANIZATION: NORTHFORK WATER PHONE: 862-3414

SAMPLE TYPE:

- ☑ COMPLIANCE *(SDWA)*:
  - ☑ CWS ☐ NTNCWS ☐ TNCWS
- ☐ RAW *(DILUTIONS REQUIRED)*
  - ☐ SURFACE ☐ GROUND
- ☐ SPECIAL PURPOSE
- ☐ REPEAT FOR LAB#: _____
- ☐ REPLACEMENT FOR LAB# _____

- ☑ INDIVIDUAL HOUSEHOLD:
  - ☑ WELL ☐ CISTERN
  - ☐ SPRING
- IS SUPPLY PROTECTED?
  - ☐ YES ☐ NO

- ☐ POOL
- ☐ BEACH
- ☐ BOTTLED WATER/ICE
- ☐ DAIRY FARM
- ☐ DAIRY PLANT
- ☐ OTHER: _____

REPORT TO BE MAILED TO:

NAME: NORTH FORK WATER

ADDRESS: PO BOX 760

CITY/STATE/ZIP: NORTHFORK, WV 24868

BOTTLE NUMBER: 2524

SAMPLE COLLECTION:

DATE: 6/3/03 TIME: 1:35 ☐ AM ☑ PM

COLLECTOR'S INITIALS: JG

CHLORINATED?
☑ YES ☐ NO RESIDUAL: ____ ☐ TOTAL ☐ FREE

pH:

SAMPLING POINT: NORTHFORK RECREATION

SAMPLE TRANSPORTATION: ☑ US MAIL ☐ UPS ☐ FEDEX
☐ AIRBORNE ☐ OTHER: _____
☐ HAND DELIVERED: ☐ BY COLLECTOR ☐ OTHER: _____
TRANSPORTATION CONDITION:
☑ PROTECTED FROM SUNLIGHT ☐ REFRIGERATED <10°C (50°F)

LAB NO. 013776 DATE REC'D JUN-4 03

METHOD OF ANALYSIS:

- ☑ MULTI TUBE FERMENTATION
- ☐ CHROMOGENIC/FLUOROGENIC
- ☐ MEMBRANE FILTRATION
- ☐ HETEROTROPHIC PLATE COUNT

SAMPLE ANALYSIS:

DATE: 6-4-03

TIME: 11 ☑ AM ☐ PM

ANALYSTS: DW

TEMP: _____ °C

TIME REC'D: 9 ☑ AM ☐ PM

REC'D BY: JC DW TEMP _____ °C

☐ *SAMPLES NOT EXAMINED DUE TO:
☐ EXCEEDED TIME ☐ INSUFF. VOLUME
☐ INSUFF. INFO. ☐ UNAUTH. COLLECTOR
☐ CONTAINED RESIDUAL CHLORINE
☐ INSUFF. AIR SPACE TO FACILITATE MIXING

LABORATORY RESULTS:

TOTAL COLIFORMS:	☐ PRESENT	☐ ABSENT	_____ PER 100 mL
FECAL COLIFORMS:	☐ PRESENT	☐ ABSENT	_____ PER 100 mL
E. COLI:	☐ PRESENT	☐ ABSENT	_____ PER 100 mL
FECAL STREPTOCOCCI:	☐ PRESENT	☐ ABSENT	_____ PER 100 mL

HETEROTROPHIC PLATE COUNT: _____ CFU/mL

FECAL COLIFORM : FECAL STREPTOCOCCI RATIO: _____

☒ *INVALID DUE TO:
☒ TURBID ☐ COLOR INDETERMINATE ☐ TNTC ☐ CONFLUENT GROWTH ☐ PARTICULATE MATTER
☐ *LABORATORY ACCIDENT *SEND REPLACEMENT SAMPLE

REMARKS: ☐ REPORTED/☐ FAXED TO: _____

☐ NOT VALID FOR SDWA COMPLIANCE REPORTING

DATE REPORTED: JUN-9 03

DIRECTOR:

WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES
BUREAU FOR PUBLIC HEALTH - OFFICE OF LABORATORY SERVICES

SO. CHARLESTON, WV 25303
KEARNEYSVILLE, WV 25430

WATER BACTERIOLOGICAL REPORT

COUNTY OF ORIGIN: Mason

REPORT TO BE CHARGED TO:

NAME: Mason Co. PSD

ADDRESS: 101 Camden Ave.

CITY/STATE/ZIP: Pt. Pleasant, WV 25550

NAME OF WATER SUPPLY: Lakin

P.W.S. I.D. # 3 3 0 2 7 1 2

CODE

COLLECTOR: DHNibert TITLE: Operator CERTIFICATION #: 4554

COLLECTORS ORGANIZATION: Mason Co. Pub. Svc. Dist. PHONE: 675-6399

SAMPLE TYPE:

- ☐ COMPLIANCE (SDWA):
  - ☑ CWS ☐ NTNCWS ☐ TNCWS
- ☐ RAW (DILUTIONS REQUIRED)
  - ☐ SURFACE ☑ GROUND
- ☒ SPECIAL PURPOSE G,W,U,D,I
- ☐ REPEAT FOR LAB#:
- ☐ REPLACEMENT FOR LAB#

- ☐ INDIVIDUAL HOUSEHOLD:
  - ☐ WELL ☐ CISTERN ☐ SPRING
- IS SUPPLY PROTECTED?
  - ☐ YES ☐ NO

- ☐ POOL
- ☐ BEACH
- ☐ BOTTLED WATER/ICE
- ☐ DAIRY FARM
- ☐ DAIRY PLANT
- ☐ OTHER:

REPORT TO BE MAILED TO:

NAME: Mason County Pub. Svc. Dist.

ADDRESS: 101 Camden AVenue

CITY/STATE/ZIP: Pt. Pleasant, WV 25550

BOTTLE NUMBER: 8004

SAMPLE COLLECTION: DATE: 6/18/03 TIME: 4:06 ☐ AM ☒ PM COLLECTOR'S INITIALS: DHN

CHLORINATED? ☐ YES ☒ NO RESIDUAL:____ ☐ TOTAL ☐ FREE

pH 7.2

SAMPLING POINT G.W.U.D.I. Wet #3 Lakin well #2 (New) 15°C

SAMPLE TRANSPORTATION: ☒ US MAIL ☐ UPS ☐ FEDEX ☐ AIRBORNE ☐ OTHER:

☐ HAND DELIVERED: ☐ BY COLLECTOR ☐ OTHER:

TRANSPORTATION CONDITION: ☐ PROTECTED FROM SUNLIGHT ☐ REFRIGERATED <10°C (50°F)

LAB NO. DATE REC'D 6/20/03

METHOD OF ANALYSIS:

- ☐ MULTI TUBE FERMENTATION
- ☒ CHROMOGENIC-FLUOROGENIC
- ☐ MEMBRANE FILTRATION
- ☐ HETEROTROPHIC PLATE COUNT

SAMPLE ANALYSIS: DATE: 6-20-03 TIME: 9 ☒ AM ☐ PM ANALYSTS: TG TEMP:____°C

TIME REC'D: 830 ☒ AM ☐ PM REC'D BY: TG TEMP____°C

☐ *SAMPLES NOT EXAMINED DUE TO:
☐ EXCEEDED TIME ☐ INSUFF. VOLUME ☐ INSUFF. INFO. ☐ UNAUTH. COLLECTOR ☐ CONTAINED RESIDUAL CHLORINE ☐ INSUFF. AIR SPACE TO FACILITATE MIXING

LABORATORY RESULTS:

TOTAL COLIFORMS:	☐ PRESENT	☒ ABSENT	210 PER 100 mL
FECAL COLIFORMS:	☐ PRESENT	☐ ABSENT	____ PER 100 mL
E. COLI:	☐ PRESENT	☐ ABSENT	____ PER 100 mL
FECAL STREPTOCOCCI:	☐ PRESENT	☐ ABSENT	____ PER 100 mL

HETEROTROPHIC PLATE COUNT: ____ CFU/mL

FECAL COLIFORM : FECAL STREPTOCOCCI RATIO:____

☐ *INVALID DUE TO:
☐ TURBID ☐ COLOR INDETERMINATE ☐ TNTC ☐ CONFLUENT GROWTH ☐ PARTICULATE MATTER

☐ *LABORATORY ACCIDENT *SEND REPLACEMENT SAMPLE

6/23/03

H.T. Freeland

REMARKS: ☐ REPORTED/☐ FAXED TO:____

☒ NOT VALID FOR SDWA COMPLIANCE REPORTING

DATE REPORTED:

DIRECTOR:

WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES
BUREAU FOR PUBLIC HEALTH - OFFICE OF LABORATORY SERVICES
SO. CHARLESTON, WV 25303
KEARNEYSVILLE, WV 25430

P.W.S. I.D. # 3 3 0 4 0 1 1

CODE

NAME: So. PuTnam P.S.D.

ADDRESS: Po. Box 147

CITY/STATE/ZIP: Scott Depot

COLLECTOR: Clive Larck TITLE: Operator CERTIFICATION #: II F 1556

COLLECTORS ORGANIZATION: So. PuTnam P.S.D. PHONE: 757-6551

SAMPLE TYPE:

❑ COMPLIANCE *(SDWA)*: ❑ CWS ❑ NTNCWS ❑ TNCWS
☒ RAW *(DILUTIONS REQUIRED)* ☒ SURFACE ❑ GROUND
❑ SPECIAL PURPOSE
❑ REPEAT FOR LAB#:
❑ REPLACEMENT FOR LAB#

❑ INDIVIDUAL HOUSEHOLD: ❑ WELL ❑ CISTERN ❑ SPRING
IS SUPPLY PROTECTED? ❑ YES ❑ NO

❑ POOL
❑ BEACH
❑ BOTTLED WATER/ICE
❑ DAIRY FARM
❑ DAIRY PLANT
❑ OTHER:

REPORT TO BE MAILED TO:

NAME: South PuTnam P.S.D.

ADDRESS: Po. Box 147

CITY/STATE/ZIP: Scott Depot WV 25560

BOTTLE NUMBER: 2716

SAMPLE COLLECTION:

DATE: 3/19/03 TIME: __:__ ❑ AM ❑ PM

COLLECTOR'S INITIALS: CL

CHLORINATED? ❑ YES ❑ NO RESIDUAL: ____ ❑ TOTAL ❑ FREE

pH

SAMPLING POINT: Poplar Fork — # No Please

SAMPLE TRANSPORTATION: ❑ US MAIL ❑ UPS ❑ FEDEX ❑ AIRBORNE ❑ OTHER:
❑ HAND DELIVERED: ❑ BY COLLECTOR ❑ OTHER:
TRANSPORTATION CONDITION:
❑ PROTECTED FROM SUNLIGHT ❑ REFRIGERATED <10°C (50°F)

LAB NO. 010923 DATE REC'D MAR 19 03

METHOD OF ANALYSIS:
❑ MULTI TUBE FERMENTATION
☒ CHROMOGENIC/FLUOROGENIC
❑ MEMBRANE FILTRATION
❑ HETEROTROPHIC PLATE COUNT

SAMPLE ANALYSIS:
DATE: 3-19-03
TIME: 11 ☒ AM ❑ PM
ANALYSTS: DW
TEMP: ____ °C

TIME REC'D: 10:30 ☒ AM ❑ PM

REC'D BY: DW TEMP ____ °C

❑ ***SAMPLES NOT EXAMINED DUE TO:**
❑ EXCEEDED TIME ❑ INSUFF. VOLUME
❑ INSUFF. INFO. ❑ UNAUTH. COLLECTOR
❑ CONTAINED RESIDUAL CHLORINE
❑ INSUFF. AIR SPACE TO FACILITATE MIXING

LABORATORY RESULTS:

TOTAL COLIFORMS:	☒ PRESENT	❑ ABSENT	2481	PER 100 mL
FECAL COLIFORMS:	❑ PRESENT	❑ ABSENT		PER 100 mL
E. COLI:	☒ PRESENT	❑ ABSENT	95	PER 100 mL
FECAL STREPTOCOCCI:	❑ PRESENT	❑ ABSENT		PER 100 mL

HETEROTROPHIC PLATE COUNT: ____ CFU/mL
FECAL COLIFORM : FECAL STREPTOCOCCI RATIO: ____
❑ *INVALID DUE TO:
❑ TURBID ❑ COLOR INDETERMINATE ❑ TNTC ❑ CONFLUENT GROWTH ❑ PARTICULATE MATTER
❑ *LABORATORY ACCIDENT ***SEND REPLACEMENT SAMPLE**

REMARKS: ❑ REPORTED/❑ FAXED TO:

❑ NOT VALID FOR SDWA COMPLIANCE REPORTING

DATE REPORTED: MAR 21 03

DIRECTOR: [signature]

WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES
BUREAU FOR PUBLIC HEALTH - OFFICE OF LABORATORY SERVICES
SO. CHARLESTON, WV 25303
KEARNEYSVILLE, WV 25430

State Laboratory SDWA and/or NPDES Pre-Survey Package4 **4/16/03 (New Chem. Original Micro)
(Please complete electronically)

Date: *June 2, 2003* Completed by (name/title): *Thomas L. Ong, Microbiologist Supervisor, CO*

I. General Information:

Note: State Laboratory will be assessed for__X__SDWA_____NPDES
For SDWA: Only Complete Tables for Methods/Analytes for which Lab Seeks Certification

A. Name of Laboratory: ***WV Dept. Of Health & Human Resources - Bureau For Public Health***
Office of Laboratory Services

B. Address: ***167 - 11th Avenue***
South Charleston, WV 25303

C. Telephone Number: ***304-558-3530, Ext. 2710***

D. Name of Laboratory Director: ***Andrea Labik, Sc.D., Director***

E. Provide an organizational chart of the laboratory, including any field operations or other internal affiliations to show how the laboratory fits into the general organizational structure.
Indicate SDWA and NPDES related portions of the laboratory organization.

Attached

F. List names of principal users of services of the laboratory.

Water Plant Operators
Sanitarians (State and County)
Engineering & Consulting Firms
Engineers WVDHHR-BPH-OEHS
Private Citizens

G. List laboratory support provided by commercial laboratories, and other State or Federal laboratories.

None

H. Indicate the approximate number of samples analyzed:
Please provide a listing of any codes used for Sample log-in which indicate the associated program.

	Microbiology		Chemical			
	Approximate Number of Samples/Year	Approximate % of Laboratory Workload/Yr.	Approximate No. Samples/Year Organic/Inorganic		Approximate % of Lab.Workload/Yr. Organic/Inorganic	
SDWA	*12,375*	*67.5%*				
NPDES						
RCRA						
Superfund						
Other Monitoring	*5,959*	*32.5%*				

II. Personnel:

Lab Name ***WVDHHR-BPH-OLS (Micro)***

Please complete this chart for all technical personnel, including the laboratory director. Use a separate block for each employee and arrange the presentation to reflect the lines of organizational responsibility.

Date ***June 2, 2003*** No. ***1*** of ***2*** pages

Name	Training		Position	Years of Experience		Identify Current Analyses Performed in Support of	
	Degree (Check One)	Major		Present Job	Previous Job	SDWA	NPDES
Andrea Labik	**Sc.D.** MS **BS/BA** Assoc. HS	*Public Health Microbioloby Biology*	*Laboratory Director*	*3.5 Years*	*13 Years*	*Administration*	
Charlotte Billingsley	Ph.D. **MS** BS/BA Assoc. HS		*Associate Director (Part-Time)*			*Administration*	
Thomas L. Ong	Ph.D. MS **BS/BA** Assoc. HS	*Biology*	*Microbiologist Supervisor Cert. Officer*	*7 Years*	*7 Years*	*Microbiology*	
Mike Flesher	Ph.D. MS **BS/BA** Assoc. HS	*Biology (Education)*	*Microbiologist III Env. Micro*	*3 Years*	*6.5 Years*	*Microbiology*	
Tracy Goodson	Ph.D. MS **BS/BA** Assoc HS	*Biology*	*Microbiologist II Env. Micro Cert. Officer (In Training)*	*3 Years*	*1 Year*	*Microbiology*	
Joe Cochran	Ph.D. MS **BS/BA** Assoc HS	*Chemistry*	*Microbiologist II Env. Micro*	*2 Years*	*2.5 Years*	*Microbiology*	

II Personnel (Cont.):

Lab Name ***WVDHHR-BPH-OLS (Micro)***

Please complete this chart for all technical personnel, including the laboratory director. Use a separate block for each employee and arrange the presentation to reflect the lines of organizational responsibility.

Date ***June 2, 2003*** No. 2 of 2 pages

Name	Training		Position	Years of Experience		Identify Current Analyses Performed in Support of	
	Degree (Check One)	Major		Present Job	Previous Job	SDWA	NPDES
Debbie Walker Newsome last ON-SITE	Ph.D. MS BS/BA Assoc. **HS**		*Lab Asst. II Env. Micro*	*2.5 Years*	*16+ Years*	*Microbiology*	
Ron Releford	Ph.D. MS **BS/BA** Assoc. HS	*Physical Education*	*Lab. Asst. III Media & Glassware*	*4.5 Years*	*9 Years*	*Media & Reagent Preparation*	
Fred Pauley	Ph.D. MS BS/BA Assoc. **HS**		*Lab. Asst. I Media & Glassware*	*8 Years*		*Media & Reagent Preparation*	
	Ph.D. MS BS/BA Assoc. HS						
	Ph.D. MS BS/BA Assoc HS						
	Ph.D. MS BS/BA Assoc HS						

III. Quality Assurance Policies and QC Procedures:

	SDWA	NPDES
	Y/N	Y/N
A. Is there a Quality Assurance Manual?	*Y*	
B. Is there a Quality Control Officer?	*N*	

C. Frequency of :

	SDWA	NPDES
	Y/N	Y/N
Duplicate Analyses?	*N/A*	
Spike Analyses?	*N/A*	
Check Standards?	*N/A*	
2nd Source QC Materials?	*N/A*	
In-House Inspections/Assessment?	*N*	

D. Records and Control Limits Maintained:

	SDWA		NPDES	
	Records	Limits	Records	Limits
	Y/N	Y/N	Y/N	Y/N
Duplicate Analyses?	*N/A*	*N/A*		
Spike Analyses?	*N/A*	*N/A*		
Check Standards?	*N/A*	*N/A*		

List analyses for which "No" applies (Items A - D above):

SDWA: _____

NPDES: _____

III. QA and QC (Cont.):

E. What corrections are taken for failed QC checks?
(With Micro, the failed Check is noted and Repeated)
Duplicate analyses (SDWA): _____

Duplicate Analyses (NPDES): _____

Spike Analyses (SDWA): _____

Spike Analyses (NPDES):_____

Calibration Check Standards:_____

F. Are records maintained of problems and corrective actions?

	SDWA	NPDES
	Y/N	Y/N
Out of control Spike results?	*N/A*	
Out of control Check Standards?	*N/A*	
Out of control duplicate results?	*N/A*	
Out of control In-House Audits?	*N*	

G. Calibration data :

	SDWA	NPDES
	Y/N	Y/N
Are instrument calibration data recorded?	*N/A*	
Does standard calibration include $\geq$ 3 standards and a reagent blank?	*N/A*	
Is one calibration standard at or below the MCL (SDWA), permit limit (NPDES)?	*N/A*	
Do standard concentrations bracket sample concentrations?	*N/A*	

List analyses for which "No" applies (Items F - G above):

SDWA: _____

NPDES: _____

III. QA and QC (cont.):

H. Routine service checks:

	SDWA	NPDES
	Y/N	Y/N
Are routine service checks performed on analytical instruments (balances/spectrophotometers etc.)?	*Y*	
Is the laboratory pure water quality monitored routinely?	*Y*	
Records of thermometer calibrations	*Y*	
Oven/ incubator /reference temperatures monitored/ and recorded	*Y*	

Who is responsible?

SDWA (Name): ***Thomas L. Ong***

NPDES (Name): _____

I. Analytical records:

	SDWA	NPDES
	Y/N	Y/N
Are all analytical records necessary to reconstruct the analyses maintained for 3 years?	*Y*	
Are calculations checked by a second analyst/ supervisor?	*Y*	

	SDWA	NPDES
	Y/N	Y/N
J. Does your laboratory have a chain-of-custody program?	*Y*	
K. Are records maintained of preservation checks (Verification of preservatives by laboratory personnel)	*N*	

Who provides the preservatives?
NPDES: ***Media, Reagent & Glassware Unit prepares Sodium Thiosulfate***
SDWA: _____

III. QA and QC (Cont.):

	SDWA	NPDES
	Y/N	Y/N
L. Is there a sample custodian?	*N*	

Name (SDWA): _____
Name (NPDES): _____

M. Who is responsible for sampling?

(SDWA): Organization: ***Water Treatment Plant Operators with at least a Class 1D License.***
Official: Trained by ***WVDHHR-BPH-Office of Env. Health Services (EED)***
Phone No.: ***304-55-2981***

(NPDES): Organization:_____
Official:_____
Phone No.:_____

	SDWA	NPDES
	Y/N	Y/N
N. Is there a written policy for field equipment calibration and maintenance?	*N/A*	
O. Are records maintained of field equipment calibration and maintenance?	*N/A*	
P. Does the laboratory have a written sample rejection policy ?	*Y*	
Q. Do samples arrive on ice?	*N*	

R. Are the following items available?

Analytical Method SOPs? Yes ___X___ No _____

Proficiency Testing (PT) Summaries? Yes ___X___ No _____

S. **PROVIDE COPY OF RESULT SUMMARIES FOR LAST THREE PT STUDIES FOR EACH METHOD/ANALYTE** ***Already on file with EPA Region III***

T. **PROVIDE COPY OF ANY INTERNAL ASSESSMENTS PERFORMED WITHIN THE LAST YEAR AND ANY ASSOCIATED CORRECTIVE ACTION PLANS.** ***N/A***

U. **PROVIDE COPY OF LABORATORY'S MOST CURRENT QUALITY MANUAL .**
Already on file with EPA Region III (Environmental Science Center in Ft. Meade, MD)

V. **COLLECT THE FOLLOWING FILES AND HAVE ON-SITE WHEN THE TEAM ARRIVES (INCLUDING FINAL REPORTS, ALL SUPPORTING "RAW DATA", AND SUPPORTING LOGS FOR EACH METHOD AND ANALYTE)**: Last PT Study; MDL studies; initial demonstration of performance/capability studies. In addition provide a listing of program codes used by the laboratory in record keeping/log-in, i.e., 00083 or "xyz" indicates SDWA compliance samples and 00094 or "nrt" indicates NPDES compliance samples, etc. **Additional records for actual compliance samples will also be requested prior to the on-site inspection.** Having these records collected prior to the actual on-site will greatly speed the process and facilitate an independent data audit (total recalculations of the results) by the EPA assessors.

Note: please select the methods you want reviewed as part of the on-site assessment carefully. If additional methods and analytes need to be reviewed and are not listed in the attached tables include a listing of such analytes and methods (reference method) here:

IV. SDWA Preservation and Holding Times for Regulated Parameters

SDWA (Place A Check or Fill-In With Other Response/s If Necessary)

Only complete for Methods/Analytes for which the Laboratory seeks SDWA Certification

Parameter/ Method	Preservative	Sample Holding Time	Extract Holding Time	Suggested Sample Size	Type of Container
Metals (except Hg)	HNO_3 pH<2	6 months	NA	1 L	Plastic or Glass
Mercury	HNO_3 pH<2	28 days	NA	100 mL	Plastic or Glass
Alkalinity	Cool, 4C	14 days	NA	100 mL	Plastic or Glass
Asbestos	Cool, 4C	48 hours	NA	1 L	Plastic or Glass
Chloride	none	28 days	NA	100 mL	Plastic or Glass
Residual Disinfectant	none	immediately	NA	200 mL	Plastic or Glass
Color	Cool, 4C	48 hours	NA	100 mL	Plastic or Glass
Conductivity	Cool, 4C	28 days	NA	100 mL	Plastic or Glass
Cyanide	Cool, 4C, Ascorbic acid (if chlorinated), NaOH pH>12	14 days	NA	1 L	Plastic or Glass
Fluoride	none	1 month	NA	100 mL	Plastic or Glass
Foaming Agents	Cool, 4C	48 hours	NA		
Nitrate (chlorinated)	Cool, 4C Non acidified	14 days	NA	100 mL	Plastic or Glass
Nitrate (non chlorinated)	Cool, 4C, Non acidified	48 hours	NA	100 mL	Plastic or Glass
Nitrite	Cool, 4C	48 hours	NA	100 mL	Plastic or Glass
$(NO_2 + NO_3)$-N	H_2SO_4 pH<2	28 days	NA	100 ml	Plastic or Glass
Odor	Cool, 4C	24 hours	NA	200 mL	Glass
pH	none	immediately	NA	25 mL	Plastic or Glass
o-Phosphate	Filter immediately, Cool, 4C	48 hours	NA	100 mL	Plastic or Glass
Silica	Cool, 4C	28 days	NA	100 mL	Plastic
Solids (TDS)	Cool, 4C	7 days	NA	100 mL	Plastic or Glass
Sulfate	Cool, 4C	28 days	NA	50 mL	Plastic or Glass

Parameter/ Method	Preservative	Sample Holding Time	Extract Holding Time	Suggested Sample Size	Type of Container
Temperature	none	immediately	NA	1 L	Plastic or Glass
Turbidity	Cool, 4C	48 hours	NA	100 mL	Plastic or Glass
502.2	Sodium Thiosulfate or Ascorbic Acid, 4C, HCl pH<2	14 days	NA	40-120 mL	Glass withPTFE Lined Septum
504.1	Sodium Thiosulfate Cool, 4C,	14 days	4C, 24 hours	40 mL	Glass with PTFE Lined Septum
505	Sodium Thiosulfate Cool, 4C	14 days (7 days for Heptachlor)	4C, 24 hours	40 mL	Glass with PTFE Lined Septum
506	Sodium Thiosulfate Cool, 4C, Dark	14 days	4C, dark 14 days	1 L	Amber Glass with PTFE lined Cap
507	Sodium Thiosulfate Cool, 4C, Dark	14 days (see method for exceptions)	4C, dark 14 days	1 L	Amber Glass with PTFE Lined Cap
508	Sodium Thiosulfate Cool, 4C, Dark	7 days (see method for exceptions)	4C, dark 14 days	1 L	Glass with Teflon PTFE Cap
508A	Cool, 4C	14 days	30 days	1 L	Glass with PTFE Lined Cap
508.1	Sodium Sulfite HCl pH<2 Cool, 4C	14 days (see method for exceptions)	30 days	1 L	Glass with PTFE Lined Cap
515.1	Sodium Thiosulfate Cool, 4C, Dark	14 days	4C, dark 28 days	1 L	Amber Glass with Teflon Lined Cap
515.2	Sodium Thiosulfate or Sodium Sulfate HCl pH<2 Cool, 4C, Dark	14 days	$\leq$ 4C, dark 14 days	1 L	Amber Glass with PTFE Lined Cap
515.3	Sodium Thiosulfate Cool, 4C, Dark	14 days	$\leq$ 4C, dark, 14 days	50 mL	Amber Glass with PTFE Lined Cap
515.4	Sodium Sulfite, Dark Cool $\leq$ 10C for first 48 hr., $\leq$ 6C there after	14 days	21 days at $\leq$0	40 mL	Amber Glass with PTFE Lined Septum
524.2	Ascorbic Acid HCl pH<2, Cool 4C or Sodium Thiosulfate	14 days	NA	40-120 mL	Glass with Teflon Lined Septum

Parameter/ Method	Preservative	Sample Holding Time	Extract Holding Time	Suggested Sample Size	Type of Container
525.2	Sodium Sulfite, Dark, Cool, 4C, HCl pH<2	14 days (see method for exceptions)	30 days from collection	1 L	Amber Glass with Teflon Lined Cap
531.1, 6610	Sodium Thiosulfate, Monochloroacetic acid, pH<3, Cool, 4C	Cool 4C, 28 days	NA	60 mL	Glass with PTFE Lined Septum
531.2	Sodium Thiosulfate, Potassium Dihydrogen Citrate buffer to pH 4, dark, ≤ 10C for first 48 hr, ≤ 6C there after	28 days	NA	40 mL	
547	Sodium Thiosulfate Cool, 4C	14 days (18 mo. frozen)	NA	60 mL	Glass with PTFE Lined Septum
548.1	Sodium Thiosulfate (HCl pH 1.5-2 if high biological activity) Cool, 4C, Dark	7 days	14 days ≤4C	≥ 250 mL	Amber Glass with Teflon Lined Septum
549.2	Sodium Thiosulfate, (H_2SO_4 pH<2 if biologically active) Cool, 4C, Dark	7 days	21 days	≥ 250 mL	High Density Amber Plastic or Silanized Amber Glass
550, 550.1	Sodium Thiosulfate Cool, 4C, HCl pH<2	7 days	550, 30 days 550.1, 40 days Dark, 4C	1 L	Amber Glass with Teflon Lined Cap
551.1	Sodium Sulfite, Ammonium Chloride, pH 4.5-5.0 with phosphate buffer, Cool, 4C	14 days	NA	≥ 40 mL	Glass with Teflon Lined Septum
552.1	Ammonium Chloride, Cool, 4C, Dark	28 days	≤4C, dark 48 hours	250 mL	Amber Glass with Teflon lined Cap
552.2	Ammonium Chloride, Cool, 4C, Dark	14 days	7 days at ≤4C, dark or 14 days at -10C, dark	≥ 50 mL	Amber Glass with Teflon lined Cap
555	Sodium Sulfite HCl, pH≤2 Dark, Cool 4C	14 days	NA	≥ 100 mL	Glass with Teflon lined cap
1613B	Sodium Thiosulfate Cool, 0-4C, Dark		Recommend 40 days	1 L	Amber Glass with PTFE Lined Cap

V. SDWA Approved Methods for Primary Inorganic Chemicals Rule, Sodium, and Turbidity [§141.23(k)(1)]

(Place A Check or Fill-In With Other Response/s If Necessary)

Only complete for Methods/Analytes for which the Laboratory seeks SDWA Certification

Approved Methods for Primary Inorganic Chemicals, Paraemters in the Lead and Copper Rule, Sodium & Turbidity

Contaminant	Methodology	EPA	ASTM[3]	SM[4]	Other
Antimony	ICP-MS	200.8[2]			
	Hydride-AA		D3697-92		
	AA-Platform	200.9[2]			
	AA-Furnace			3113B	
Arsenic	ICP	200.7[2]		3120B	
	ICP-MS	200.8[2]			
	AA-Platform	200.9[2]			
	AA-Furnace		D2972-93C	3113B	
	Hydride-AA		D2972-93B	3114B	
Asbestos	TEM	100.1[9]			
	TEM	100.2[10]			
Barium	ICP	200.7[2]		3120B	
	ICP-MS	200.8[2]			
	AA-Direct			3111D	
	AA-Furnace			3113B	
Beryllium	ICP	200.7[2]		3120B	
	ICP-MS	200.8[2]			
	AA-Platform	200.9[2]			
	AA-Furnace		D3645-93B	3113B	
Bromate	1C	300.1			
Cadmium	ICP	200.7[2]			
	ICP-MS	200.8[2]			
	AA-Platform	200.9[2]			
	AA-Furnace			3113B	
Chlorite	IC	300.0			
	IC	300.1			
Chromium	ICP	200.7[2]		3120B	
	ICP-MS	200.8[2]			
	AA-Platform	200.9[2]			
	AA-Furnace			3113B	

Contaminant	Methodology	EPA	ASTM[3]	SM[4]	Other
Cyanide	Manual Distillation followed by:		D203 6-91A	4500-CN-C	
	Spec., Amenable		D2036-91B	4500-CN-G	
	Spec., Manual		D2036-91A	4500-CN-E	I-3300-85[5]
	Semi-auto	335.4[6]			
	Ion Sel. Elec. (ISE)			4500CN-F	
Mercury	Manual Cold Vapor	245.1[2]	D3223-91	3112B	
	Auto. Cold Vapor	245.2[1]			
	ICP-MS	200.8[2]			
Nitrate	Ion Chromatography	300.0[6]	D4327-91	4110B	B-1011[8]
	Auto Cd Reduction	353.2[6]	D3867-90A	4500-NO_3-F	
	Ion Selective Elec.			4500-NO_3-D	601[7]
	Man Cd Reduction		D3867-90B	4500-NO_3-E	
Nitrite	Ion Chromatography	300.0[6]	D4327-91	4110B	B-1011[8]
	Auto Cd Reduction	353.2[6]	D3867-90A	4500-NO_3-F	
	Man Cd Reduction		D3867-90B	4500-NO_3-E	
	Spectrophotometric			4500-NO_2-B	
Selenium	Hydride-AA		D3859-93A	3114B	
	ICP-MS	200.8[2]			
	AA-Platform	200.9[2]			
	AA-Furnace		D3859-93B	3113B	
Thallium	ICP-MS	200.8[2]			
	AA-Platform	200.9[2]			

Contaminant	Methodology	EPA	ASTM[3]	SM[4]	Other
Lead	AA-Furnace		D3559-90D	3113B	
	ICP-MS	200.8[2]			
	AA-Platform	200.9[2]			
Copper	AA-Furnace		D1688-90C	3113B	
	AA-Direct		D1688-90A	3111B	
	ICP	200.7[2]		3120B	
	ICP-MS	200.8[2]			
	AA-Platform	200.9[2]			
pH	Electrometric	150.1[1]	D1293-84	4500-H^+-B	
	Electrometric (Continuous Monitoring)	150.2[1]			
Conductivity	Conductance		D1125-91A	2510B	
Calcium	EDTA titration		D511-93A	3500-Ca-D	
	AA-Direct		D511-93B	3111B	
	ICP	200.7[2]		3120B	
Alkalinity	Titration		D1067-92B	2320B	
	Elec. titration				I-1030-85[5]
Orthophosphate unfiltered, no digestion or hydrolysis	Color, automated ascorbic acid	365.1[6]		4500-P-F	
	Color, ascorbic acid		D515-88A	4500-P-E	
	Color, phosphomolybdate				I-1601-85[5]
	AutoSegmented Flow				I-2601-90[5]
	Auto discrete				1-2598-85[5]
	Ion Chromatography	300.0[6]	D4327-91	4110	
Silica	Color, molybdate blue;				1-1700-85[5]
	auto seg. flow				1-2700-85[5]
	Color		D859-88		
	Molybdosilicate			4500-Si-D	
	Heteropoly blue			4500-Si-E	
	Auto. molybdate reactive silica			4500-Si F	
	ICP	200.7[2]		3120B	I-1700-85[5]

Contaminant	Methodology	EPA	ASTM[3]	SM[4]	Other
Temperature	Thermometric			2550B	
Sodium	ICP	200.7[2]			
	AA-Direct			3111B	
Turbidity	Nephelometric[6]	180.1		2130B	GLI Method 2[12]

FOOTNOTES

1 Methods 150.1, 150.2 and 245.2 are available from US EPA, EMSL, Cincinnati, OH 45268. The identical methods were formerly in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983.

2 "Methods for the Determination of Metals in Environmental Samples - Supplement I," EPA-600/R-94-111, May 1994. Available at NTIS, PB 94-184942.

3 *Annual Book of ASTM Standards*, Vols. 11.01 and 11.02, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

4 *Standard Methods for the Examination of Water and Wastewater*, 18th Edition, 1992, American Public Health Association, 1015 Fifteenth Street NW, Washington, D.C. 20005.

5 Available from Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225-0425.

6 "Methods for the Determination of Inorganic Substances in Environmental Samples," EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811.

7 Technical Bulletin 601 "Standard Method of Test for Nitrate in Drinking Water," July 1994, PN 221890-001, Thermo Orion, 500 Cummins Center, Beverly, MA 01915-9846. This method is identical to Orion WeWWG/5880, which is approved for nitrate analysis. ATI Orion republished the method in 1994, and renumbered it as 601, because the 1985 manual "Orion Guide to Water and Wastewater Analysis," which contained WeWWG/5880, is no longer available.

8 Method B-1011, "Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography," Millipore Corporation, Waters Chromatography Division, 34 Maple Street, Milford, MA 01757.

9 Method 100.1, "Analytical Method for Determination of Asbestos Fibers in Water," EPA-600/4-83-043, EPA, September 1983. Available at NTIS, PB 83-260471.

10 Method 100.2, "Determination of Asbestos Structure Over 10-μm In Length in Drinking Water," EPA-600/R-94-134, June 1994. Available at NTIS, PB 94-201902.

11 Industrial Method No. 129-71W, "Fluoride in Water and Wastewater," December 1972, and Method No. 380-75WE, "Fluoride in Water and Wastewater," February 1976, Technicon Industrial Systems, Tarrytown, NY 10591.

12 GLI Method 2, "Turbidity," November 2, 1992, GLI International, 9020 W Dean Rd. Milwaukee, Wisconsin 53224.

VI. SDWA Approved Methods for Primary Organic Chemicals [§141.24(e)]

(Place a Check or Enter Response/s if Necessary)

Only complete for Methods/Analytes for which the Laboratory seeks SDWA Certification

Contaminant	Method[3]
Aldicarb	531.1, 6610*
Aldicarb sulfone	531.1, 6610*
Aldicarb sulfoxide	531.1, 6610*
Benzene	502.2, 524.2,
Carbon tetrachloride	502.2, 524.2, 551, 551.1
Chlorobenzene	502.2, 524.2
1,2-Dichlorobenzene	502.2, 524.2
1,4-Dichlorobenzene	502.2, 524.2
1,2-Dichloroethane	502.2, 524.2
cis-1,2-Dichloroethylene	502.2, 524.2
trans-1,2-Dichloroethylene	502.2, 524.2
Dichloromethane	502.2, 524.2
1,2-Dichloropropane	502.2, 524.2
Ethylbenzene	502.2, 524.2
Styrene	502.2, 524.2
Tetrachloroethylene	502.2, 524.2, 551.1
1,1,1-Trichloroethane	502.2, 524.2, 551.1
Trichloroethylene	502.2, 524.2, 551.1
Toluene	502.2, 524.2
1,2,4-Trichlorobenzene	502.2, 524.2
1,1-Dichloroethylene	502.2, 524.2
1,1,2-Trichloroethane	502.2, 524.2, 551.1
Vinyl chloride	502.2, 524.2
Xylenes (total)	502.2, 524.2
2,3,7,8-TCDD (dioxin)	1613
2,4-D (as acids, salts and esters)	515.1, 515.2, 515.3, 555, D5317-93, 515.4
Alachlor	505[1], 507, 508.1, 525.2, 551.1
Atrazine	505[1], 507, 508.1, 525.2
Benzo(a)pyrene	525.2, 550, 550.1
Carbofuran	531.1, 6610; 531.2
Chlordane	505, 508, 508.1, 525.2

Contaminant	Method[3]
Dalapon	515.1, 515.3, 552.1, 552.2, 515.4
Di(2-ethylhexyl)adipate	506, 525.2
Di(2-ethylhexyl)phthalate	506, 525.2
Dibromochloropropane (DBCP)	504.1, 551, 551.1
Dinoseb	515.2,515.1, 555, 515.3,515.4
Diquat	549.1, 549.2
Endothall	548.1
Endrin	505, 508, 508.1, 525.2, 551.1
Ethylene dibromide (EDB)	504.1, 551, 551.1
Glyphosate	547, 6651
Haloacetic Acids	552.1, 552.2
Heptachlor	505, 508, 508.1, 525.2, 551.1
Heptachlor Epoxide	505, 508, 508.1, 525.2, 551.1
Hexachlorobenzene	505, 508, 508.1, 525.2, 551.1
Hexachlorocyclopentadiene	505, 508, 508.1, 525.2, 551.1
Lindane	505, 508, 508.1, 525.2, 551.1
Methoxychlor	505, 508, 508.1, 525.2, 551.1
Oxamyl	531.1, 6610, 531.2
PCBs (as decachlorobiphenyl)[2] (as Aroclors)	508A 505, 508, 508.1, 525.2
Pentachlorophenol	515.1, 515.2, 525.2, 555, 515.3, 5317-93, 515.4
Picloram	515.1, 515.2, 555 , 515.3, D5317-93, 515.4
Simazine	505[1], 507, 508.1, 525.2, 551.1
2,4,5-TP (Silvex)	515.1, 515.2, 555, 515.3, D5317-93, 515.4
Toxaphene	505, 508, 525.2, 508.1
Total Trihalomethanes	502.2, 524.2, 551, 551.1
MTBE (UCMR)	524.2
Nitrobenzene (UCMR)	524.2

[1] A nitrogen-phosphorus detector should be substituted for the electron capture detector in Method 505 (or another approved method should be used) to determine alachlor, atrazine and simazine, if lower detection limits are required.

[2] PCBs are qualitatively identified as Aroclors and measured for compliance purposes as decachlorobiphenyl using Method 508A.

[3] Methods 502.2, 505, 507, 508, 508A, 515.1 and 531.1 are in Methods for the Determination of Organic Compounds in Drinking Water, EPA-600/4-88-039, December 1988, Revised, July 1991. Methods 506, 547, 550, 550.1 and 551 are in Methods for the Determination of Organic Compounds in Drinking Water - Supplement I, EPA-600-4-90-020, July 1990. Methods 515.2, 524.2, 548.1, 549.1, 552.1 and 555 are in Methods for the Determination of Organic Compounds in Drinking Water - Supplement II, EPA-600/R-92-129, Methods 502.2, 504.1, 505, 506, 507, 508, 508.1, 515.1, 515.2, 524.2, 525.2, 531.1, 551.1, 552.2 are in Methods for the Determination of Organic Compounds in Drinking Water - Supplement III, EPA 600/R-95/131, Method 1613, Tetra-Through Octa- Chlorinated Dioxins and Furans by Isotopic Dilution HRGC/HRMS, EPA-81/B-94-003, October 1994 These documents are available from the National Technical Information Service, NTIS PB91-231480, PB91-146027 and PB92-207703 and PB95-104774, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-553-6847. Method 1613 is available from USEPA Office of Water Resource Center (RC-4100), 401 M. Street S.W., Washington, D.C. 20460. The phone number is 202-260-7786. EPA Methods 504.1, 508.1 and 525.2 are available from US EPA NERL, Cincinnati, OH 45268. The phone number is (513)-569-7586. Method 6651 and 6610 are contained in the currently approved editions of *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, 1015 Fifteenth Street NW, Washington, D.C. 20005.

VII. SDWA Approved Methods for Disinfectant Residuals

(Place A Check Or Fill-In Other Response/s If Necessary)

Public water systems must measure residual disinfectant concentrations with one of the analytical methods in the following table. The methods are contained in the 18th edition of *Standard Methods for the Examination of Water and Wastewater.*

Only complete for Methods/Analytes for which the Laboratory seeks SDWA Certification

Residual[1]	Methodology	SM[3]
Free Chlorine[2]	Amperometric Titration DPD Ferrous Titrimetric DPD Colorimetric Syringaldehyde (FACTS)	4500-Cl D, D1253-86 4500-Cl F 4500-Cl G 4500-Cl H
Combined Chlorine (Chloramines)	Ampermetric Titration DPD Ferous Titrimetric DPD Colorimetric	4500-CID D1253-86 4500-CIF 4500-CIG
Total Chlorine[2]	Amperometric Titration Amperometric Titration (low level measurement) DPD Ferrous Titrimetric DPD Colorimetric Iodometric Electrode	4500-Cl D 4500-Cl E 4500-Cl F 4500-Cl G 4500-Cl I
Chlorine Dioxide	Amperometric Titration DPD Method Amperometric Titration	4500-ClO_2 C[4] 4500-ClO_2 D 4500-ClO_2 E
Ozone	Indigo Method	4500-O_3 B

Footnotes

[1] If approved by the State, residual disinfectant concentrations for free chlorine and combined chlorine also may be measured by using DPD colorimetric test kits.

[2] Free and total chlorine residuals may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument provided the chemistry, accuracy, and precision of the measurement remain the same. Instruments used for continuous monitoring must be calibrated with a grab sample measurement at least every five days, or with protocol approved by the State.

[3] *Standard Methods for the Examination of Water and Wastewater*, 18th Edition, 1992

[4] Method 4500-ClO_2 is not approved for determining compliance at 141.131(c) because the other two methods are superior.

VIII. SDWA Recommended Methods for Secondary Drinking Water Contaminants

(Place A Check or Fill-In Other Response/s If Necessary)

Analyses of aluminum, chloride, color, fluoride, foaming agents, iron, manganese, odor, silver, sulfate, total dissolved solids (TDS) and zinc to determine compliance under §143.3 may be conducted with the methods in the following Table. Criteria for analyzing aluminum, iron, manganese, silver, and zinc samples with digestion or directly without digestion, and other mandatory procedures are contained in Section IV of "Technical Notes on Drinking Water Methods" EPA/600/R-94/173, October 1994. Measurement of pH may be conducted with one of the methods listed above in Section I under "Methods for Inorganic Chemicals."

Only complete for Methods/Analytes for which the Laboratory seeks SDWA Review

Contaminant	EPA	ASTM[1]	SM[2]	Other
Aluminum	200.7[3]		3120B	
	200.8[3]		3113B	
	200.9[3]		3111D	
Chloride	300.0[4]	D4327-91	4110B	
		D51289B	4500-Cl⁻-D	
Color			2120B	
Fluoride	300.0	D4327-91 D1179-93	4110 B 4500-F B, C, D, E	380-75WE[11] 129-71W[5]
Foaming Agents			5540C	
Iron	200.7[3]		3120B	
	200.9[3]		3111B	
			3113B	
Manganese	200.7[3]		3120B	
	200.8[3]		3111B	
	200.9[3]		3113B	
Odor			2150B	
Silver	200.7[3]		3120B	I-3720-85[6]
	200.8[3]		3111B	
	200.9[3]		3113B	
Sulfate	300.0[4]	D4327-91	4110B	
	375.2[4]	D516-90	4500-SO_4-E, -F	
			4500-SO_4 C,D	
TDS			2540C	
Zinc	200.7[3]		3120B	
	200.8[3]		3111B	

Footnotes

[1] *Annual Book of ASTM Standards*, Vols. 11.01 and 11.02, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

[2] *Standard Methods for the Examination of Water and Wastewater*, 18th Edition, 1992, American Public Health Association, 1015 Fifteenth Street NW, Washington, D.C. 20005.

[3] "Methods for the Determination of Metals in Environmental Samples - Supplement I," EPA-600/R-94-111, May 1994. Available at NTIS, PB94-184942.

[4] "Methods for the Determination of Inorganic Substances in Environmental Samples," EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811.

[5] Industrial Method No. 129-71W, "Fluoride in Water and Wastewater," December 1972, and Method No. 380-75WE, "Fluoride in Water and Wastewater, "February 1976, Technician Industrial Systems, Tarrytown, NY 10591.

[6] Available from Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225-0425.

MICROBIOLOGY LABORATORY ANALYSIS REVIEW CHECKLIST

LABORATORY WV Dept. Health & Human Services

ADDRESS Bureau for Public Health
Office of Laboratory Services
167 11th Avenue
South Charleston, WV 25303

TELEPHONE NUMBER/FAX NUMBER (304) 558-3530 / (304) 558-2006

CONDUCTED BY David E. Russell

DATE June 24-25, 2003

NAMES/TITLES/RESPONSIBILITIES OF KEY PERSONNEL INTERVIEWED

Tom Ong	Microbiologist Supervisor	*
Mike Flesher	Microbiologist III	*
Tracy Goodson	Microbiologist II	attending C.O. training
Joe Cochran	Microbiologist II	*
Debbie Walker	Lab Asst. II	*
Ron Rehefeld	Lab Asst. III	out sick
Fred Pauley	Lab Asst. I	*

* Spoke with.

Element	Yes	No	Comments
1. PERSONNEL			
1.1 Supervisor/Consultant			
Supervisor of analyst has a bachelor's degree in microbiology, biology, or equivalent with at least one college-level laboratory course in environmental microbiology, and has a minimum of two weeks course training or 80 hours of on-the-job training in water microbiology at a certified laboratory, or other training acceptable to the State or EPA	✓		
If supervisor not available, consultant with same training and experience substituted, acceptable to the State, and present on-site frequently enough to satisfactorily perform a supervisor's duties			N/A
1.2 Analyst (or equivalent job title)			
Analyst has a high school education, 3 months bench experience in microbiology, training in microbiological analysis of drinking water acceptable to the State (or EPA) and a minimum of 30 days on-the-job training under an experienced analyst	✓		
Analyst demonstrated acceptable results for precision, specificity, and satisfactory analysis on unknown samples before analyzing compliance samples	✓		
1.3 Waiver of Academic Training Requirement			
Need for specified academic training waived for highly experienced analysts			N/A
1.4 Personnel Records			
Personnel records maintained on laboratory analysts include academic background, specialized training courses completed and types of microbiological analyses conducted	✓		
2. LABORATORY FACILITIES			
Laboratory facilities clean, temperature and humidity controlled, with adequate lighting at bench top	✓		
Sufficient space available for processing samples, bench top equipment, storage, cleaning glassware and sterilizing materials	✓		
Provisions made for disposal of microbiological wastes	✓		
3. LABORATORY EQUIPMENT AND SUPPLIES			
3.1 pH meter			
Accuracy and scale graduations within ± 0.1 units	✓		
Buffer aliquot used only once	✓		
Commercial buffer solutions dated upon receipt, and when opened. Buffers discarded upon expiration date.	✓		

per ERRATA list

Element	Yes	No	Comments
Electrodes maintained according to manufacturer's recommendations	✓		
QC Meter standardized each use period with pH 7.0 and either 4.0 or 10.0 buffers, with date and buffers used recorded in log book	✓		
QC Commercial buffer solutions dated when received and opened and discarded upon expiration date	✓		
3.2. Balance (top loader or pan)			
Readability of 0.1 g	✓		
QC Calibrated monthly using ASTM type 1, 2, or 3 weights (minimum 3 traceable weights which bracket laboratory weighing needs)	✓		
QC Non-reference weights calibrated every six months with reference weights			N/A
QC Annual service contract or internal maintenance protocol established, records available of most recent recalibration, and correction values on file and used	✓		
QC Reference weight recertified if damaged or corroded	✓		last done 2/03
3.3 Temperature Monitoring Device			
Temperature monitoring devices graduated in 0.5°C increments (0.2°C increments for tests which are incubated at 44.5°C) or less	✓		
No separation in fluid column of glass thermometer	✓		
No dial thermometers used which cannot be adjusted	✓		No dial thermometers.
QC Glass and electronic thermometers calibrated annually, dial thermometers quarterly, at the temperature used against reference NIST thermometer or one meeting the requirements of NBS Monograph SP 250-23	✓		
QC Calibration factor marked on thermometer and calibration date and calibration factor recorded in QC record book	✓		
QC Thermometer discarded if off more than 1°C from reference thermometer, reference thermometers recalibrated every 3-5 years	✓		None seen.
QC Continuous recording devices used to monitor incubator temperature recalibrated annually as above			N/A
3.4 Incubator Unit			
Incubator units have an internal temperature monitoring device and maintain temperature of 35 ± 0.5°C, and if used, 44.5 ± 0.2°C	✓		

IND Maintenance conducted annually (minimum)

Element	Yes	No	Comments
Thermometers placed on top and bottom shelves of use area in non-portable incubators, with thermometer bulb immersed in liquid (except for electronic thermometers)	✓		
For aluminum block incubator, culture dishes and tubes fit snugly			N/A
QC Calibration-corrected temperature recorded twice daily for days in use, readings separated by at least four hours	✓		
Water bath equipped with gable cover and pump or paddles used to circulate water (recommended for maintaining 44 ± 0.2°C)	✓		
3.5 Autoclave			
Autoclave has internal heat source, temperature gauge with sensor on exhaust, pressure gauge, and operational safety valve	✓		
Maintains sterilization temperature during cycle and completes entire cycle within 45 minutes when 12-15 minute sterilization period used	✓		
Depressurizes slowly enough to ensure media will not boil over and bubbles will not form in inverted tubes	✓		
Pressure cookers not used	✓		
QC Date, contents, sterilization time, temperature, total cycle time, and analyst's initials recorded for each cycle	✓		
QC Copy of service contract or internal maintenance protocol and maintenance records kept	✓		
QC Maintenance conducted annually at a minimum, with record of most recent service performed available for inspection	✓		bimonthly maintenance!
QC Maximum-temperature-registering thermometer or continuous recording device used each autoclave cycle and temperature recorded	✓		
QC Overcrowding avoided	✓		
QC Spore strips or ampules used monthly	✓		
QC Automatic timing mechanism checked quarterly with stopwatch or other accurate timepiece or time signal	✓		
Autoclave door seals clean and free of caramelized media	✓		
Autoclave drain screen cleaned frequently	✓		
3.6 Hot Air Oven			
Maintains stable sterilization temperature of 170-180°C for at least 2 hours		✓	N/A ~~Not used for SDSA analysis.~~ DR
Only dry items sterilized in hot air oven		✓	N/A DR

At first told they do not use it. Later told they do use it for wooden sticks.

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Element	Yes	No	Comments
Overcrowding avoided	✓		N/A DR
Oven thermometer graduated in 10°C increments or less, with bulb placed in sand during use	✓		N/A DR
QC Date, contents, sterilization time, temperature, and analyst's initials recorded for each cycle	✓		N/A DR
QC Spore strip or ampule used monthly	✓		N/A DR
3.7 Colony Counter			
Colony counter, dark field model, used to count Heterotrophic Plate Count colonies	✓		
3.8 Conductivity Meter			
Suitable for checking laboratory reagent-grade water, readable in micromhos/cm or microsiemens/cm with measurement error not exceeding 1% or 1 micromhos/cm, whichever is more lenient	✓		
QC Cell constant determined monthly			N/A
In-line unit which cannot be calibrated not used to check reagent-grade water			N/A
3.9 Refrigerator			
Maintains 1-5°C	✓		
Thermometer graduated in 1°C increments or less, with thermometer bulb immersed in liquid	✓		
QC Temperature recorded for days in use at least once per day	✓		
3.10 Inoculating Equipment			
Sterile metal or disposable plastic loops, wood applicator sticks, sterile swabs, or sterile plastic disposable pipet tips used	✓		
Wood applicator sticks sterilized by dry heat	✓		
Metal inoculating loops and needles made of nickel alloy or platinum (nickel alloy loops not used for oxidase test)			N/A
3.11 Membrane Filtration (MF) Equipment			
MF units of stainless steel, glass, or autoclavable plastic, not scratched or corroded and do not leak	✓		
QC Graduations on funnels used to measure sample volume checked for accuracy have tolerance of ≤2.5%, and a record of this calibration check retained	✓		

Element	Yes	No	Comments
10x to 15x stereo microscope with fluorescent light source used to count sheen colonies	✓		
Membrane filters approved by manufacturer for use in total coliform analysis of water	✓		
Membrane filters of cellulose ester, white, gridmarked, 47 mm diameter, and 0.45 μm pore size	✓		
Membrane filters and pads purchased presterilized or autoclaved before use	✓		
Lot number and date received recorded for membrane filters	✓		
3.12 Culture Dishes (loose or tight lids)			
Presterilized plastic or sterilizable glass culture dishes used	✓		
Sterility of glass culture dishes maintained by placement in stainless steel or aluminum canisters or wrapped in heavy aluminum foil or char-resistant paper	✓		
Loose-lid dishes incubated in tight-fitting container with moistened paper towel	✓		
Opened packs of disposable culture dishes resealed between use periods	✓		
3.13 Pipets			
Glass pipets sterilized and maintained in stainless steel or aluminum canisters or wrapped individually in char-resistant paper or aluminum foil	✓		
Pipets with legible markings, not chipped or etched	✓		
Opened packs of disposable sterile pipets resealed between use periods	✓		
Pipets delivering volumes of 10 mL or less accurate within 2.5% tolerance	✓		
Micropipetters used with sterile tips, calibrated annually, and replaced if tolerance greater than 2.5%	✓		
3.14 Culture Tubes and Closures			
Tubes of borosilicate glass or other corrosion-resistant glass or plastic	✓		
Culture tubes and containers of sufficient size to contain medium plus sample without being more than three quarters full	✓		
Tube closures used of stainless steel, plastic, aluminum, or screw caps with non-toxic liner; cotton plugs not used	✓		

Element	Yes	No	Comments
3.15 Sample Containers			
Wide-mouth plastic or non-corrosive glass bottles, with non-leaking ground glass stoppers or caps with non-toxic liners, or sterile plastic bags containing sodium thiosulfate used	✓		
Sample container capacity at least 120 mL (4 oz)	✓		
Glass stoppers covered with aluminum foil or char-resistant paper for sterilization			N/A
Sample containers sterilized by autoclaving or (for glass bottles) dry heat	✓		
Containers moistened with several drops of water before autoclaving to prevent "air lock" sterilization failure	✓		
Sufficient sodium thiosulfate added to sample containers before sterilization, if laboratory analyzes chlorinated water	✓		
3.16 Glassware and Plasticware			
Glassware made of borosilicate glass or other corrosion-resistant glass, free of chips and cracks, with markings legible	✓		
Plastic items clear and non-toxic to microorganisms	✓		
QC Graduated cylinders and pre-calibrated containers used to measure samples volumes accurate with a tolerance of 2.5% or less	✓		
QC New lots of pre-calibrated containers validated to have 2.5% tolerance	✓		
3.17 Ultraviolet Lamp (if used)			
Unit cleaned monthly by wiping with soft cloth moistened with ethanol	✓		
QC If used for sanitization, tested quarterly with UV light meter or by agar spread plate method (other methods acceptable if data demonstrates they are as effective)			N/A
4. GENERAL LABORATORY PRACTICES			
Laboratory facilities clean, temperature and humidity controlled, and adequate lighting	✓		
4.1 Sterilization Procedures			

Element	Yes	No	Comments
Required times for autoclaving material at 121 °C (except for membrane filters and pads and carbohydrate-containing media, indicated times represent minimum times, dependent upon volumes, containers, and loads): - membrane filters and pads 10 min - carbohydrate containing media 12-15 min - contaminated test materials ~~30 min~~ 45 min - membrane filter assemblies 15 min - sample collection containers 15 min - individual glassware 30 ~~15~~ min - dilution water blank 15 min - rinse water (0.5 - 1 L) 15-30 min* * time depends upon water volume per container and autoclave load	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓		@ 132 °C
Autoclaved membrane filters and pads and all media removed immediately after completion of sterilization cycle	✓		
Membrane filter equipment autoclaved before beginning of first filtration series (filtration series ends when 30 minutes or longer elapses after a sample filtered)	✓		
When UV light (254 nm) used to sanitize equipment, all supplies presterilized and QC checks conducted on UV lamp			N/A
UV light used to control bacterial carry-over between samples during filtration series (optional)			N/A
4.2 Sample Containers			
QC Sterility of each lot of sample containers or bags confirmed by adding 25 mL of a sterile non-selective broth to at least one container, incubating at 35 ± 0.5°C for 24 hours and checking for growth	✓		
4.3 Reagent-Grade Water			
Only satisfactorily tested reagent water from stills or deionization units used to prepare media, reagents and dilution/rinse water	✓		

Element	Yes	No	Comments
QC Quality of reagent water should be tested and meets the following criteria: - conductivity — <2 micromhos/cm (microsiemens/cm) at 25°C — monthly - Pb, Cd, Cr Cu, Ni, Zn — not greater than 0.05 mg/L per contaminant, and no greater than 0.1 mg/L total — annually - total chlorine residual* — <0.1 mg/L — monthly - heterotrophic plate count* — <500/mL — monthly - bacteriological quality of reagent water* — ratio of growth rate 0.8 to 3.0 — annually *See section 4.3.2 of this chapter for additional details	✓ ✓ ✓ ✓	✓	
4.4 Dilution/Rinse Water			
Stock buffer solution or peptone water prepared as specified in Standard Methods	✓		
Stock buffers autoclaved or filter-sterilized and containers labeled, dated, and refrigerated	✓		
Stored stock buffer free of turbidity	✓		
QC Each batch of dilution/rinse water checked for sterility by adding 50 mL of water to 50 mL double strength non-selective broth, incubating at 35 ± 0.5°C for 24 hours, and checking for growth		✓	
4.5 Glassware Washing			
Distilled or deionized water used for final rinse	✓		
QC Glassware inhibitory residue test performed on initial use of washing compound and whenever different formulation or washing procedure used	✓		
QC Batches of dry glassware spot-checked for pH reaction	✓		
Laboratory glassware washed with detergent designed for laboratory use	✓		
5. ANALYTICAL METHODOLOGY			
5.1 General			

Element	Yes	No	Comments
Only analytical methodology specified in Total Coliform Rule and Surface Water Treatment Rule used for compliance samples	✓		
Laboratory certified for all analytical methods it uses for compliance purposes	✓		
Laboratory certified for at least one total coliform method and one fecal coliform or *E. coli* method	✓		
Laboratory certified for a second total coliform method, if one method cannot be used for some drinking waters	✓		
Laboratory that enumerates heterotrophic bacteria (i.e., HPC) for compliance with the Surface Water Treatment Rule certified for the Pour Plate Method	✓		
Absorbent pads, when used, saturated with liquid medium and excess removed			N/A
Water sample shaken vigorously (about 25 times) before analysis	✓		
QC If no total coliform-positive results occur during a quarter, laboratory performs coliform procedure using a known coliform-positive, fecal coliform- and/or *E. coli*-positive control to spike the sample			N/A
Sample volume analyzed for total coliforms in drinking water is 100 ± 2.5 mL	✓		
Media			
Dehydrated or prepared media manufactured commercially used (strongly recommended)	✓		
Dehydrated media stored in cool dry location and caked or discolored dehydrated media discarded	✓		
QC Laboratory media preparation records include: - date of preparation - type of medium - lot number - sterilization time and temperature - final pH - technician's initials	✓ ✓ ✓ ✓ ✓ ✓		
QC For liquid media prepared commercially, the following are recorded: - date received - type of medium - lot number - pH verification			N/A

Element	Yes	No	Comments
QC Liquid media prepared commercially discarded by manufacturer's expiration date			N/A.
QC Each new lot of dehydrated and prepared commercial medium checked before use with positive and negative culture controls and results recorded	✓		
QC Each new batch of laboratory-prepared medium checked before use with positive and negative culture controls and results recorded	✓		
Prepared plates refrigerated in sealed plastic bags or containers not longer than two weeks, with bag or container dated with preparation or expiration date	✓		
Loose-cap tubes of broth stored at <30°C no longer than two weeks, tightly capped tubes no longer than 3 months at <30°C	✓		
Refrigerated medium incubated at room temperature overnight before use and discarded if growth observed	✓		N/A
QC Parallel testing performed between a newly approved test procedure and another EPA-approved procedure for several months and/or several seasons (recommended)	✓		but N/A.
5.2 Membrane Filter (MF) Technique (for total coliforms in drinking water)			
Media			
M-Endo broth or agar or LES Endo agar in single step or enrichment technique used	✓		
Ethanol not denatured	✓		
Medium prepared in sterile flask and dissolved using boiling water bath or hot plate with stir bar	✓		
Medium not boiled	✓		
LES Endo agar medium pH 7.2 ± 0.2 M-Endo medium pH 7.2 ± 0.1	✓		
MF broth refrigerated no longer than 96 hours, poured MF agar plates no longer than 2 weeks, ampuled M-Endo broth as per manufacturer's expiration date	✓		
Uninoculated media discarded if growth or surface sheen observed	✓		
QC Sterility check conducted on each funnel in use at beginning and end of each filtration series (filtration series ends when 30 minutes or more elapse between sample filtrations)	✓		

Element	Yes	No	Comments
QC If sterility control indicates contamination, all data rejected and another sample requested	✓		
Funnels rinsed with two or three 20-30 mL portions of sterile rinse water after each sample filtration to prevent carry-over	✓		
Inoculated medium incubated at 35° ± 0.5°C for 22-24 hours	✓		
Samples resulting in confluent or too numerous to count (TNTC) growth invalidated unless total coliforms detected (if laboratory performs verification test before invalidation and test is total coliform-positive, sample is reported as such, but if test is total coliform-negative, sample is invalidated)	✓		
Sample not invalidated if membrane filter contains at least one sheen colony	✓		
All sheen colonies verified (up to a maximum of five) using either single strength (LB) or (LTB) and single strength (BGLBB) or an EPA-approved cytochrome oxidase and beta-galactosidase rapid test procedure	✓		
When picking individual colonies, up to five red questionable sheen colonies and/or red non-sheen colonies verified to include different types or entire MF surface is swabbed	✓		
When EC medium or EC medium + MUG used, colonies transferred by employing one option specified by 141.21 (f)(5)	✓		
Swab used to transfer presumptive total coliform-positive culture can inoculate up to three different media (e.g., EC medium, LTB, and BGLBB in that order)	✓		
5.3 Multiple Tube Fermentation Technique (MTF or MPN) (for total coliforms in drinking water)			Using 100ml method.
Total sample volume of 100 mL examined by test configuration found in 141.21 (f)(3) or Appendix G	✓		
Media			
LTB used in presumptive test and BGLBB in confirmed test	✓		
LB used if system conducts at least 25 parallel tests between this medium and LTB and demonstrates false-positive rate and false-negative rate for total coliforms of less than 10%, with comparison documented and records retained	X	✓	N/A
LTB pH 6.8 ± 0.2	✓		
BGLBB pH 7.2 ± 0.2	✓		
Test medium concentration adjusted to compensate for sample volume so resulting medium single strength after sample addition	✓		

yellow = acid

Element	Yes	No	Comments
If single 100 mL sample volume used, inverted vial replaced with acid indicator (= bromo cresol purple)	✓		using b.c. purple
Medium autoclaved at 121°C for 12-15 minutes	✓		
Inverted vials in sterile medium free of bubbles and at least one-half to two-thirds covered after water sample added			N/A
Refrigerated sterile MTF media incubated overnight at room temperature before use, with tubes/bottles showing growth and/or bubbles discarded. Media discarded if evap. exceeds 10% of original volume.			N/A stored at R.T.
Prepared broth media stored in dark at <30°C for no longer than 3 months in screw-cap tubes/bottles, two weeks for those with loose-fitting closures	✓		
Media discarded if evaporation exceeds 10% of original volume	✓		
Inoculated medium incubated at 35°C ± 0.5°C for 24 ± 2 hours			
If no gas or acid detected, inoculated medium incubated for another 24 hours	✓		
All samples showing turbid culture (i.e., heavy growth, opaque) in the absence of gas/acid production invalidated and another sample collected from the same location (if laboratory performs confirmed test on turbid culture and confirmed test is total coliform-positive, sample reported as such, but if total coliform-negative, sample is invalidated)	✓		
All 24- and 48-hour gas-positive or acid-positive tubes confirmed using BGLBB	✓		
Completed Test not required	✓		
When MTF test used on water supplies that have a history of confluent growth or TNTC by the MF procedure, all presumptive tubes with heavy growth without gas/acid production submitted to confirmed test and fecal coliform/*E. coli* test to check for coliform suppression	✓		
5.4 Presence-Absence (P-A) Coliform Test (for drinking water)			
Medium			
When six-times formulation strength medium used, medium filter-sterilized, not autoclaved			N/A
Medium autoclaved for 12 minutes at 121°C with total time in autoclave less than 30 minutes and with space between bottles			N/A
Medium pH 6.8 ± 0.2			N/A

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Element	Yes	No	Comments
Prepared medium stored in the dark at <30°C for no longer than 3 months			N/A
Stored medium discarded if evaporation exceeds 10% of original volume			N/A
100 mL sample inoculated into P-A culture bottle			N/A
Medium incubated at 35° ± 0.5°C and observed for yellow color (acid) after 24 and 48 hours			N/A
Yellow cultures confirmed in BGLBB and fecal coliform/*E. coli* test conducted			N/A
Non-yellow turbid culture in P-A medium invalidated and another sample obtained from the same location (if confirmed test performed and sample is total coliform-positive, sample is reported as such, but if confirmed test is negative, sample invalidated)			N/A
5.5 Fecal Coliform Test (using EC Medium for fecal coliforms in drinking or source water, or A-1 Medium for fecal coliforms in source water only)			
EC medium used to determine whether total coliform-positive culture taken from distribution system contains fecal coliforms, in accordance with Total Coliform Rule	✓		
EC medium used to enumerate fecal coliforms in source water, in accordance with Surface Water Treatment Rule, using cultures transferred from each total coliform-positive tube	✓		
Three sample volumes (10, 1, and 0.1 mL) and 5 or 10 tubes/sample volume used			N/A
Autoclaved at 121°C for 12-15 minutes	✓		
Medium pH 6.9 ± 0.2	✓		
Inverted vials free of bubbles and at least one-half to two-thirds covered after sample added	✓		
Tubes with loose-fitting closures used within two weeks, tightly closed screw-cap tubes no longer than 3 months when held in the dark at <30°C	✓		
Refrigerated medium incubated at room temperature overnight before use and tubes with growth or bubbles in vials discarded			N/A
Alternatively, A-1 Medium used to enumerate fecal coliforms in source water, in accordance with Surface Water Treatment Rule			N/A
A-1 medium not used for drinking water samples			N/A

Element	Yes	No	Comments
Three sample volumes of source water (10, 1, and 0.1 mL) and 5 or 10 tubes/sample volume used			N/A
Autoclaved at 121°C for 10 minutes			N/A
Medium pH 6.9 ± 0.1			N/A
Inverted vials free of air bubbles and at least one-half to two-thirds covered after water sample added			N/A
Loose-cap tubes stored in dark at room temperature no longer than 2 weeks, tightly closed screw-cap tubes no longer than 3 months when held in the dark at <30°C			N/A
Water level in water bath above upper level of medium in culture tubes	✓		
EC Medium incubated at 44.5°C ± 0.2°C for 24 ± 2 hours	✓		
A-1 Medium incubated at 35°C ± 0.5°C for 3 hours, then at 44.5°C ± 0.2°C for 21 ± 2 hours			N/A
Any gas detected in inverted vial considered fecal coliform positive			
5.6 Chromogenic/Fluorogenic Substrate Tests (MMO-MUG Test [Colilert] for total coliforms in source water and total coliforms and *E. coli* in drinking water; Colisure Test for total coliforms and *E. coli* in drinking water)			
Media			
Purchased from commercially available source only	✓		
Media protected from light	✓		
Colisure medium refrigerated until use, brought to room temperature before adding sample			N/A
Each lot of medium checked for autofluoresence before use with 366-nm ultraviolet light with 6 watt bulb	✓		
Medium which exhibits faint fluorescence discarded and another lot used	✓		
Medium plus sample which exhibits color change before incubation discarded and another batch of medium used	✓		
QC Each lot of medium checked by inoculating sterile water containing the medium with (1) MUG-positive *E. coli* strain, a (2) MUG-negative coliform, and (3) a non-coliform and analyzing them	✓		"Must"
If Quanti-Tray or Quanti-Tray 2000 test used with Colilert medium, sealer checked monthly to determine leakage	✓		

Element	Yes	No	Comments
Glass bottles that contain inoculated medium checked with 366-nm ultraviolet light source with 6 watt bulb and discarded if fluorescence observed before incubation			N/A
For enumeration of total coliforms in source water with Colilert Test, 5 or 10 tube MTF, Quanti-Tray, or Quanti-Tray 2000 used for each sample dilution tested			
For chromogenic/fluorogenic substrate test only, sterile dechlorinated tap water, deionized water, or distilled water used as dilution water	✓		"Must"
For determining presence of total coliforms in drinking water by chromogenic/fluorogenic substrate test, 10 tubes each containing 10 mL water sample or single vessel containing 100 mL sample used	✓		
For Colilert Test:			
Sample incubated at 35° ± 0.5° for 24 hours (for Colilert-18 test, sample incubated 18 hours)	✓		
Yellow color in medium equal to or greater than reference comparator indicates total coliform presence	✓		
Medium with yellow color lighter than comparator and incubated for another 4 hours (28 hours total)	✓		
Yellow color in medium lighter than comparator incubated for 28 hours recorded as negative	✓		
For Colisure Test:			
Sample incubated at 35° ± 0.5°C for 28 to 48 hours			N/A
Total coliform positive sample indicates color change from yellow to magenta			N/A
For *E. coli* determination, UV lamp (366-nm, 6-watt) shone on total coliform-positive bottles/tubes in darkened room with blue fluorescence indicating *E. coli* presence			
QC Air-type incubators tested to determine time necessary for cold 100 mL water sample (or set of 100 mL water samples) to reach incubation temperature of 35°C, ensuring specified incubation time at that temperature is followed			Using Walk-in 35°C Air Incub. Large!
Colilert/Colisure Test not used to confirm total coliforms on membrane filters	✓		
Colilert/Colisure Test not used to confirm total coliforms in MTF or P-A tests	✓		
5.7 EC Medium + MUG (for *E. coli*)			

Element	Yes	No	Comments
Total coliform-positive culture transferred to EC medium + MUG			N/A
Medium			
MUG added to EC medium before autoclaving or commercially available EC + MUG used			N/A
Final MUG concentration 50 µg/mL			N/A
Medium pH 6.9 ± 0.2			N/A
Inverted vial omitted (optional)			N/A
Test tubes and autoclaved medium checked for autofluorescence before use with 366-nm UV light			N/A omit
If fluorescence exhibited, non-fluorescing tubes or another lot of medium that does not fluoresce used or MUG-positive (*E. coli*) and a MUG-negative (e.g. uninoculated) control included for each analysis			N/A
Prepared medium in tubes with loose-fitting closures used within two weeks, or three months for tightly closed screw-cap tubes when held in the dark at <30°C			N/A
Uninoculated medium with growth discarded			N/A
QC Each lot of commercially prepared medium and each batch of laboratory-prepared medium checked by inoculating LTB with positive and negative culture controls, incubating at 35°C ± 0.5°C for 24 hours and then transferring to EC Medium + MUG for further incubation at 44.5°C ± 0.2°C for 24 hours, with results read and recorded			N/A
Water level of water bath above upper level of medium			N/A
Incubated at 44.5° ± 0.2°C for 24 ± 2 hours			N/A
Fluorescence checked using UV lamp (366-nm) with 6 watt bulb in a darkened room			N/A
5.8 Nutrient Agar + MUG Test (for *E. coli*)			
Medium			N/A
Medium autoclaved in 100 mL volumes at 121°C for 15 minutes			N/A
MUG added to Nutrient Agar before autoclaving or Nutrient Agar + MUG purchased commercially			N/A
Final MUG concentration 100 µg/L			N/A
Medium pH 6.8 ± 0.2			N/A

Element	Yes	No	Comments
Medium in petri dishes stored refrigerated in plastic bag or tightly closed container and used within two weeks			N/A
Refrigerated sterilized medium incubated at room temperature overnight and plates with growth discarded			N/A
QC Quality of medium lot/batch evaluated by filtering or spot-inoculating positive and negative control cultures onto membrane filter on M-Endo medium, incubating at 35°C for 24 hours, then transferring filter to NA + MUG and further incubating at 35°C for 4 hours, with results read and recorded			N/A
Filter containing total coliform colony(ies) transferred to surface of Nutrient Agar + MUG medium			N/A
Before incubation, presence of each sheen colony marked on petri dish lid with permanent marker, and lid and base marked to realign lid when removed			N/A
For total coliform verification test, portion of colony transferred with needle before or after NA + MUG incubation			N/A
Alternatively, membrane filter surface swabbed with sterile cotton swab after 4 hour incubation and transferred to total coliform verification test			N/A
Inoculated medium incubated at 35 ± 0.5°C for 4 hours			N/A
Fluorescence checked using UV lamp (366 nm) with 6 watt bulb in a darkened room, with any fluorescence in halo around sheen colony considered positive for *E. coli*			N/A
5.9 **Heterotrophic Plate Count** for enumerating heterotrophs in drinking water			
Pour Plate Method used for enumerating heterotrophic bacteria in drinking water and for testing reagent grade water	✓		
For systems granted a variance from Total Coliform Rule's maximum contaminant level, any method in Standard Methods used with R2A medium for enumerating heterotrophic bacteria in drinking water			N/A
Media (plate count agar [tryptone glucose extract agar] and R2A agar)			
Plate count agar pH 7.0 ± 0.2	✓		
R2A agar pH 7.2 ± 0.2			N/A
(For Pour Plate Method) melted agar tempered at 44-46°C in waterbath before pouring, held no longer than 3 hours, and melted only once	✓		

Element	Yes	No	Comments
(For Spread Plate Method) 15 mL of R2A medium or other medium poured into petri dish and solidified			N/A
Refrigerated medium in bottles or screw-capped tubes stored for up to 6 months, petri dishes with medium for up to 2 weeks (one week for R2A prepared petri dishes)	✓		
Countable plates obtained for most potable waters by plating 1.0 mL and/or 0.1 mL volume of undiluted sample	✓		
At least duplicate plates per dilution used	✓		
(For Pour Plate Method)			
Sample pipetted aseptically into bottom of petri dish and then 12-15 mL tempered melted agar added	✓		
Sample mixed with spillage avoided	✓		
After solidification on level surface, plates inverted and incubated at 35°C ± 0.5°C for 48 ± 3 hours	✓		
Plates stacked no more than four high	✓		
(For Spread Plate Method)			
0.1 or 0.5 mL of sample or dilution pipetted onto surface of pre-dried agar plate and inoculum spread over entire agar surface using sterile bent glass rod			N/A
Inoculum absorbed completely before plates inverted and incubated at 20-28°C for 5-7 days			N/A
(For Membrane Filter Technique)			
Volume filtered to yield between 20-200 colonies			N/A
Filter transferred to petri dish containing 5 mL solidified R2A medium and incubated at 20-28°C for 5-7 days			N/A
Petri dishes with loose-fitting lids placed in container with close fitting lid and moistened paper towels			N/A
Colonies counted using stereoscopic microscope at 10-15X magnification			N/A
(For Pour Plate and Spread Plate Techniques)			
Colonies counted manually using dark field colony counter	✓		
Only plates with 30 to 300 colonies counted, except for plates inoculated with 1.0 mL of undiluted sample	✓		
Fully automatic colony counters not used	✓		

Element	Yes	No	Comments
QC Medium sterility verified by pouring final control plate and data rejected if control contaminated	✓		
5.10 Membrane Filter Technique (for enumerating total coliforms in source water)			Use Quantitray for source water.
Same as Section 5.2, Membrane Filter Technique (for total coliforms in drinking water), except invalidation does not apply	✓		
Appropriate sample dilutions used to yield 20 to 80 total coliform colonies per membrane	✓		
Initial counts adjusted based upon verified data			N/A
QC If two or more analysts available, each counts total coliform colonies on same membrane monthly and agree within 10%	✓		
5.11 Multiple Tube Fermentation Technique (for enumerating total coliforms in source water)			Use Quantitray.
At least three series of 5 tubes each with appropriate sample dilutions of source water used	✓		
Same as Section 5.3, Multiple Tube Fermentation Technique (for total coliforms in drinking water) except on sample invalidation	✓		
All samples invalidated which produce turbid growth in the absence of gas/acid production in LTB or LB and another sample obtained, which may be tested using another method	✓		
Alternatively, confirmed test performed on turbid culture in the absence of gas/acid production and, if total coliform-positive, most probable number reported, or if total coliform-negative, sample invalidated and another requested	✓		
5.12 Fecal Coliform Membrane Filter Procedure (for enumerating fecal coliforms in source water)			Use Quantitray.
Medium			
m-FC broth (with or without agar) sterilized by bringing to boiling point, not autoclaved	✓		
Medium final pH 7.4 ± 0.2	✓		
Prepared medium refrigerated and broth discarded after 96 hours, poured agar medium in petri dishes after 2 weeks	✓		
Uninoculated medium discarded if growth observed	✓		
Sample volumes yield 20-60 fecal coliform colonies per membrane for at least one dilution	✓		

Element	Yes	No	Comments
QC Funnels rinsed with two or three 20-30 mL portions of sterile rinse water after each sample filtration to prevent carry-over	✓		
QC Sterility checked at beginning and end of each filtration series and all data rejected from affected samples and resampling requested if controls contaminated	✓		
Inoculated medium incubated at 44.5°C ± 0.2°C for 24 ± 2 hours	✓		
QC If two or more analysts available, each counts fecal coliform colonies on same membrane monthly and counts agree within 10%	✓		
6. SAMPLE COLLECTION, HANDLING, AND PRESERVATION			
6.1 Sample Collector			
Trained in aseptic sampling procedures and, if required, approved by appropriate regulatory authority or designated representative	✓		
6.2 Sampling			
Sample representative of water distribution system	✓		
Water taps used for sampling free of aerators, strainers, hose attachments, mixing type faucets, and purification devices	✓		
Cold water tap used	✓		
Service line cleared before sampling by maintaining steady water flow for at least 2 minutes	✓		
At least 100 mL sample volume collected, allowing one inch air space in container	✓		
Sample information form completed immediately after sample collection	✓		
Source water representative of supply, collected not too far intake at a reasonable distance from shore	✓		
6.3 Sample Icing			
Samples held at < 10°C during transit to laboratory (recommended for drinking water) ~~required for source water~~) ERRATA		✓	Some Q. about what are source water compliance samples.
6.4 Sample Holding/Travel Time			
Time from sample collection to initiation of analysis for total coliforms, fecal coliforms, or *E. coli* does not exceed 30 hours for drinking water samples	✓		
Time from sample collection to initiation of analysis for total coliforms and fecal coliforms in source water and heterotrophic bacteria in drinking water does not exceed 8 hours		✓	Flagged as "Not Valid for SDWA Compliance Reporting"

Element	Yes	No	Comments
All samples analyzed on day of receipt by laboratory, unless laboratory receives sample late in day and then refrigerates sample overnight and begins analysis within holding time	✓		
6.5 Sample Information Form			
Entered on sample information form in indelible ink: - name of system (PWSS identification number if available) - sample identification (if any) - sample site location - sample type (e.g. routine, repeat, raw or process) - date and time of collection - analysis required - disinfectant residual - name of sampler and organization (if not water system) - sampler's initials - person(s) transporting sample from system to laboratory (if not sampler) - transportation condition (e.g. < 10°C, protection from sunlight), if shipper used, shipping records available - any remarks	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓	
6.6 Chain-of-Custody			
Applicable regulations followed by collectors and laboratory	✓		
7. QUALITY ASSURANCE			
Written QA Plan prepared, followed, and available for inspection	✓		
8. RECORDS AND DATA REPORTING			
8.1 Legal Defensibility			
Compliance monitoring data legally defensible by keeping thorough and accurate records	✓		
QA plan and/or SOPs describe policies and procedures used by facility for record retention and storage	✓	✓	
Chain-of-custody procedures used if samples expected to become part of legal action	✓		
8.2 Maintenance of Records			
Microbiological analyses records kept by or accessible to laboratory for at least 5 years or until next certification data audit completed, whichever is longer	✓	✓	
Client water system notified before disposal of records	✓		
8.3 Sampling Records			

Element	Yes	No	Comments
Data recorded in ink with changes lined through such that original entry visible and changes initialed and dated	✓		Some initialed but not dated
Sampling records include: - sample information form, from Section 6.5 - date and time of sample receipt by laboratory - name of laboratory person receiving sample - if any deficiency in sample condition noted, sample, at a minimum, flagged - if sample transit time exceeds 30 hours (8 hours for source water samples), sample tagged	✓		not all
8.4 Analytical Records			
Data recorded in ink with changes lined through such that original entry visible and with changes initialed and dated	✓		
Analytical records include: - laboratory sample identification - date and time analysis begins - laboratory and person(s) responsible for performing analysis - analytical technique or method used - all items marked QC - results of analysis	✓		not all
8.5 Preventive Maintenance			
Preventive maintenance and repair records for all instruments and equipment kept for 5 years	✓		
9. ACTION RESPONSE TO LABORATORY RESULTS			
9.1 Testing Total Coliform-Positive Cultures		✓	
For the Total Coliform Rule, all total coliform positive cultures tested for presence of either fecal coliforms or *E. coli*	✓		
9.2 Notification of Positive Results		✓	
For Total Coliform Rule, proper authority notified promptly by laboratory of positive total coliform, fecal coliform or *E. coli* results	✓		
Total coliform positive result based on confirmed phase for MTF Technique and P-A Coliform Test or verified test for MF Technique (no requirement for confirmation of positive Colilert/Colisure, fecal coliform or *E. coli* tests)	✓		
9.3 Invalidation of Total Coliform-Negative Sample			
For Total Coliform Rule, proper authority notified when results indicate non-coliforms may have interfered with total coliform analysis	✓		

IX. SDWA MICROBIOLOGY LABORATORY ANALYSIS REVIEW CHECKLIST

Please complete and return with Pre-Survey Package

Laboratory _ *West Virginia Department of Heath & Human Services*
Bureau For Public Health
OFFICE OF LABORATORY SERVICES
ENVIRONMENTAL MICROBIOLOGY

Address *167 - 11th Avenue*
South Charleston, WV 25303

Telephone Number/Fax Number Telephone: *304-558-3530, Ext 2110 (Lab Director)*
304-558-3530, Ext. 2710 (Env. Microbiology Supervisor)
Fax: *304-558-2006*

NAMES /TITLES/ RESPONSIBILITIES OF KEY PERSONNEL INTERVIEWED

Dr. Andrea Labik, Director - Office of Laboratory Services

Thomas L. Ong, Microbiologist Supervisor - Supervisor of Environmental Microbiology Unit, Laboratory Certification Officer

Mike Flesher, Microbiologist III - Analyst

Tracy Goodson, Microbiologist II - Analyst, Laboratory Certification Officer In-trainig (Will not be present due to conflict with EPA Drinking Water Certification Officer's Course)

Joe Cochran, Microbiologist II - Analyst

Debbie Walker, Laboratory Assistant II - Analyst

Ron Releford, Laboratory Assistant III - Lead Worker, Media, Reagent & Glassware Preparation Unit

Fred Pauley, Laboratory Assistant I - Media, Reagent & GlasswarePreparationUnit

Element	Yes	No	Comments
1. PERSONNEL			
1.1 Supervisor/Consultant			
Supervisor of analyst has a bachelor's degree in microbiology, biology, or equivalent with at least one college-level laboratory course in environmental microbiology, and has a minimum of two weeks course training or 80 hours of on-the-job training in water microbiology at a certified laboratory, or other training acceptable to the State or EPA	X		
If supervisor not available, consultant with same training and experience substituted, acceptable to the State, and present on-site frequently enough to satisfactorily perform a supervisor's duties			N/A
1.2 Analyst (or equivalent job title)			
Analyst has a high school education, 3 months bench experience in microbiology, training in microbiological analysis of drinking water acceptable to the State (or EPA) and a minimum of 30 days on-the-job training under an experienced analyst	X		
Analyst demonstrated acceptable results for precision, specificity, and satisfactory analysis on unknown samples before analyzing compliance samples	X		
1.3 Waiver of Academic Training Requirement			
Need for specified academic training waived for highly experienced analysts			N/A
1.4 Personnel Records			
Personnel records maintained on laboratory analysts include academic background, specialized training courses completed and types of microbiological analyses conducted	X		
2. LABORATORY FACILITIES			
Laboratory facilities clean, temperature and humidity controlled, with adequate lighting at bench top	X		
Sufficient space available for processing samples, bench top equipment, storage, cleaning glassware and sterilizing materials	X		
Provisions made for disposal of microbiological wastes	X		
3. LABORATORY EQUIPMENT AND SUPPLIES			
3.1 pH meter			
Accuracy and scale graduations within ± 0.1 units	X		
Buffer aliquot used only once	X		

Element	Yes	No	Comments
according to manufacturer's recommendations	X		
QC Meter standardized each use period with pH 7.0 and either 4.0 or 10.0 buffers, with date and buffers used recorded in log book	X		
QC Commercial buffer solutions dated when received and opened and discarded before expiration date	X		
3.2. Balance (top loader or pan)			
Readability of 0.1 g	X		
QC Calibrated monthly using ASTM type 1, 2, or 3 weights (minimum 3 traceable weights which bracket laboratory weighing needs)	X		
QC Non-reference weights calibrated every six months with reference weights			N/A
QC Annual service contract or internal maintenance protocol established, records available of most recent recalibration, and correction values on file and used	X		
QC Reference weight recertified if damaged or corroded			N/A
3.3 Temperature Monitoring Device			
Temperature monitoring devices graduated in 0.5°C increments (0.2°C increments for tests which are incubated at 44.5°C) or less	X		
No separation in fluid column of glass thermometer	X		
No dial thermometers used which cannot be adjusted			N/A
QC Glass and electronic thermometers calibrated annually, dial thermometers quarterly, at the temperature used against reference NIST thermometer or one meeting the requirements of NBS Monograph SP 250-23	X		
QC Calibration factor marked on thermometer and calibration date and calibration factor recorded in QC record book	X		
QC Thermometer discarded if off more than 1oC from reference thermometer, reference thermometers recalibrated every 3-5 years	X		
QC Continuous recording devices used to monitor incubator temperature recalibrated annually as above			N/A
3.4 Incubator Unit			
Incubator units have an internal temperature monitoring device and maintain temperature of 35 ± 0.5°C, and if used, 44.5 ± 0.2°C	X		

Element	Yes	No	Comments
Thermometers placed on top and bottom shelves of use area in non-portable incubators, with thermometer bulb immersed in liquid (except for electronic thermometers)	X		
For aluminum block incubator, culture dishes and tubes fit snugly			N/A
QC Calibration-corrected temperature recorded twice daily for days in use, readings separated by at least four hours	X		
Water bath equipped with gable cover and pump or paddles used to circulate water (recommended for maintaining 44 ± 0.2oC)	X		
3.5 Autoclave			
Autoclave has internal heat source, temperature gauge with sensor on exhaust, pressure gauge, and operational safety valve	X		
Maintains sterilization temperature during cycle and completes entire cycle within 45 minutes when 12-15 minute sterilization period used	X		
Depressurizes slowly enough to ensure media will not boil over and bubbles will not form in inverted tubes	X		
Pressure cookers not used	X		
QC Date, contents, sterilization time, temperature, total cycle time, and analyst's initials recorded for each cycle	X		
QC Copy of service contract or internal maintenance protocol and maintenance records kept	X		
QC Maintenance conducted annually at a minimum, with record of most recent service performed available for inspection	X		
QC Maximum-temperature-registering thermometer or continuous recording device used each autoclave cycle and temperature recorded	X		
QC Overcrowding avoided	X		
QC Spore strips or ampules used monthly	X		
QC Automatic timing mechanism checked quarterly with stopwatch or other accurate timepiece or time signal	X		
Autoclave door seals clean and free of caramelized media	X		
Autoclave drain screen cleaned frequently	X		
3.6 Hot Air Oven			
Maintains stable sterilization temperature of 170-180°C for at least 2 hours	X		
Only dry items sterilized in hot air oven	X		

Element	Yes	No	Comments
Electrodes maintained according to manufacturer's recommendations	X		
QC Meter standardized each use period with pH 7.0 and either 4.0 or 10.0 buffers, with date and buffers used recorded in log book	X		
QC Commercial buffer solutions dated when received and opened and discarded before expiration date	X		
3.2. Balance (top loader or pan)			
Readability of 0.1 g	X		
QC Calibrated monthly using ASTM type 1, 2, or 3 weights (minimum 3 traceable weights which bracket laboratory weighing needs)	X		
QC Non-reference weights calibrated every six months with reference weights			N/A
QC Annual service contract or internal maintenance protocol established, records available of most recent recalibration, and correction values on file and used	X		
QC Reference weight recertified if damaged or corroded			N/A
3.3 Temperature Monitoring Device			
Temperature monitoring devices graduated in 0.5°C increments (0.2°C increments for tests which are incubated at 44.5°C) or less	X		
No separation in fluid column of glass thermometer	X		
No dial thermometers used which cannot be adjusted			N/A
QC Glass and electronic thermometers calibrated annually, dial thermometers quarterly, at the temperature used against reference NIST thermometer or one meeting the requirements of NBS Monograph SP 250-23	X		
QC Calibration factor marked on thermometer and calibration date and calibration factor recorded in QC record book	X		
QC Thermometer discarded if off more than 1oC from reference thermometer, reference thermometers recalibrated every 3-5 years	X		
QC Continuous recording devices used to monitor incubator temperature recalibrated annually as above			N/A
3.4 Incubator Unit			
Incubator units have an internal temperature monitoring device and maintain temperature of 35 ± 0.5°C, and if used, 44.5 ± 0.2°C	X		

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Element	Yes	No	Comments
Thermometers placed on top and bottom shelves of use area in non-portable incubators, with thermometer bulb immersed in liquid (except for electronic thermometers)	X		
For aluminum block incubator, culture dishes and tubes fit snugly			N/A
QC Calibration-corrected temperature recorded twice daily for days in use, readings separated by at least four hours	X		
Water bath equipped with gable cover and pump or paddles used to circulate water (recommended for maintaining 44 ± 0.2oC)	X		
3.5 Autoclave			
Autoclave has internal heat source, temperature gauge with sensor on exhaust, pressure gauge, and operational safety valve	X		
Maintains sterilization temperature during cycle and completes entire cycle within 45 minutes when 12-15 minute sterilization period used	X		
Depressurizes slowly enough to ensure media will not boil over and bubbles will not form in inverted tubes	X		
Pressure cookers not used			N/A
QC Date, contents, sterilization time, temperature, total cycle time, and analyst's initials recorded for each cycle	X		
QC Copy of service contract or internal maintenance protocol and maintenance records kept	X		
QC Maintenance conducted annually at a minimum, with record of most recent service performed available for inspection	X		
QC Maximum-temperature-registering thermometer or continuous recording device used each autoclave cycle and temperature recorded	X		
QC Overcrowding avoided	X		
QC Spore strips or ampules used monthly	X		
QC Automatic timing mechanism checked quarterly with stopwatch or other accurate timepiece or time signal	X		
Autoclave door seals clean and free of caramelized media	X		
Autoclave drain screen cleaned frequently	X		
3.6 Hot Air Oven			
Maintains stable sterilization temperature of 170-180°C for at least 2 hours	X		
Only dry items sterilized in hot air oven	X		

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Element	Yes	No	Comments
Overcrowding avoided	X		
Oven thermometer graduated in 10°C increments or less, with bulb placed in sand during use	X		
QC Date, contents, sterilization time, temperature, and analyst's initials recorded for each cycle	X		
QC Spore strip or ampule used monthly	X		
3.7 Colony Counter			
Colony counter, dark field model, used to count Heterotrophic Plate Count colonies	X		
3.8 Conductivity Meter			
Suitable for checking laboratory reagent-grade water, readable in micromhos/cm or microsiemens/cm with measurement error not exceeding 1% or 1 micromhos/cm, whichever is more lenient	X		
QC Cell constant determined monthly	X		**Calibrated w/ Low Level Std.**
In-line unit which cannot be calibrated not used to check reagent-grade water	X		
3.9 Refrigerator			
Maintains 1-5°C	X		
Thermometer graduated in 1°C increments or less, with thermometer bulb immersed in liquid	X		
QC Temperature recorded for days in use at least once per day	X		
3.10 Inoculating Equipment			
Sterile metal or disposable plastic loops, wood applicator sticks, sterile swabs, or sterile plastic disposable pipet tips used	X		
Wood applicator sticks sterilized by dry heat	X		
Metal inoculating loops and needles made of nickel alloy or platinum (nickel alloy loops not used for oxidase test)			**N/A**
3.11 Membrane Filtration (MF) Equipment			**Not used for SDWA Compliance Testing**
MF units of stainless steel, glass, or autoclavable plastic, not scratched or corroded and do not leak	X		
OC Graduations on funnels used to measure sample volume checked for accuracy have tolerance of $\geq$2.5%, and a record of this calibration check retained		X	
10x to 15x stereo microscope with fluorescent light source used to count sheen colonies	X		

D/each use?

What is it used for?

Element	Yes	No	Comments
Membrane filters approved by manufacturer for use in total coliform analysis of water	X		
Membrane filters of cellulose ester, white, gridmarked, 47 mm diameter, and 0.45 µm pore size	X		
Membrane filters and pads purchased presterilized or autoclaved before use	X		
Lot number and date received recorded for membrane filters	X		
3.12 Culture Dishes (loose or tight lids)			
Presterilized plastic or sterilizable glass culture dishes used	X		
Sterility of glass culture dishes maintained by placement in stainless steel or aluminum canisters or wrapped in heavy aluminum foil or char-resistant paper	X		**Glass Dishes used only for Detergent Residue Test**
Loose-lid dishes incubated in tight-fitting container with moistened paper towel	X		
Opened packs of disposable culture dishes resealed between use periods	X		
3.13 Pipets			
Glass pipets sterilized and maintained in stainless steel or aluminum canisters or wrapped individually in char-resistant paper or aluminum foil	X		
Pipets with legible markings, not chipped or etched	X		
Opened packs of disposable sterile pipets resealed between use periods	X		
Pipets delivering volumes of 10 mL or less accurate within 2.5% tolerance	X		
Micropipetters used with sterile tips,calibrated annually, and replaced if tolerance greater than 2.5%	X		
3.14 Culture Tubes and Closures			
Tubes of borosilicate glass or other corrosion-resistant glass or plastic	X		
Culture tubes and containers of sufficient size to contain medium plus sample without being more than three quarters full	X		
Tube closures used of stainless steel, plastic, aluminum, or screw caps with non-toxic liner; cotton plugs not used	X		
3.15 Sample Containers			

Element	Yes	No	Comments
Wide-mouth plastic or non-corrosive glass bottles, with non-leaking ground glass stoppers or caps with non-toxic liners, or sterile plastic bags containing sodium thiosulfate used	X		
Sample container capacity at least 120 mL (4 oz)	X		
Glass stoppers covered with aluminum foil or char-resistant paper for sterilization			N/A
Sample containers sterilized by autoclaving or (for glass bottles) dry heat	X		
Containers moistened with several drops of water before autoclaving to prevent "air lock" sterilization failure	X		
Sufficient sodium thiosulfate added to sample containers before sterilization, if laboratory analyzes chlorinated water	X		
3.16 Glassware and Plasticware			
Glassware made of borosilicate glass or other corrosion-resistant glass, free of chips and cracks, with markings legible	X		
Plastic items clear and non-toxic to microorganisms	X		
QC Graduated cylinders and pre-calibrated containers used to measure samples volumes accurate with a tolerance of 2.5% or less	X		
QC New lots of pre-calibrated containers validated to have 2.5% tolerance	X		
3.17 Ultraviolet Lamp (if used)			
Unit cleaned monthly by wiping with soft cloth moistened with ethanol	X		
QC If used for sanitization, tested quarterly with UV light meter or by agar spread plate method (other methods acceptable if data demonstrates they are as effective)			N/A
4. GENERAL LABORATORY PRACTICES			
Laboratory facilities clean, temperature and humidity controlled, and adequate lighting	X		
4.1 Sterilization Procedures			
Required times for autoclaving material at 121°C (except for membrane filters and pads and carbohydrate-containing media, indicated times represent minimum times, dependent upon volumes, containers, and loads): - membrane filters and pads 10 min - carbohydrate containing me 12-15 min - contaminated test materials 30 min - membrane filter assemblies 15 min - sample collection containers 15 min - individual glassware 15 min - dilution water blank 15 min - rinse water (0.5 - 1 L) 15-30 min* * time depends upon water volume per container and autoclave load	– X X X X X X* X	DR	N/A *45 Minutes @ 132°C *30 Minutes
Autoclaved membrane filters and pads and all media removed immediately after completion of sterilization cycle	X		
Membrane filter equipment autoclaved before beginning of first filtration series (filtration series ends when 30 minutes or longer elapses after a sample filtered)	X		
When UV light (254 nm) used to sanitize equipment, all supplies presterilized and QC checks conducted on UV lamp			N/A

Element	Yes	No	Comment
UV light used to control bacterial carry-over between samples during filtration series (optional)			N/A
4.2 Sample Containers			
QC Sterility of each lot of sample containers or bags confirmed by adding 25 mL of a sterile non-selective broth to at least one container, incubating at 35 ± 0.5oC for 24 hours and checking for growth	X		
4.3 Reagent-Grade Water			
Only satisfactorily tested reagent water from stills or deionization units used to prepare media, reagents and dilution/rinse water	X		
QC Quality of reagent water should be tested and meets the following criteria:			
- conductivity <2 micromhos/cm ((microsiemens/cm) at 25oC — monthly	X		
- Pb, Cd, Cr Cu, Ni, Zn not greater than 0.05 mg/L per contaminant, and no greater than 0.1 mg/L total — annually	X		
- total chlorine residual* <0.1 mg/L — monthly	X		
- heterotrophic plate count* <500/mL — monthly	X		
- bacteriological quality of reagent water* ratio of growth rate 0.8:3.0 — annually			N/A
*See section 4.3.2 of this chapter for additional details			
4.4 Dilution/Rinse Water			
Stock buffer solution or peptone water prepared as specified in Standard Methods	X		
Stock buffers autoclaved or filter-sterilized and containers labeled, dated, and refrigerated	X		
Stored stock buffer free of turbidity	X		
QC Each batch of dilution/rinse water checked for sterility by adding 50 mL of water to 50 mL double strength non-selective broth, incubating at 35 ± 0.50C for 24 hours, and checking for growth		X	**Rinse Water not used for SDWA Compliance Analysis. Dilution Water Checked for Sterility by Heterotrophic Plate Count** — Log?
4.5 Glassware Washing			
Distilled or deionized water used for final rinse	X		
QC Glassware inhibitory residue test performed on initial use of washing compound and whenever different formulation or washing procedure used	X		
QC Batches of dry glassware spot-checked for pH reaction	X		
Laboratory glassware washed with detergent designed for laboratory use	X		
5. ANALYTICAL METHODOLOGY			
5.1 General			
Only analytical methodology specified in Total Coliform Rule and Surface Water Treatment Rule used for compliance samples	X		
Laboratory certified for all analytical methods it uses for compliance purposes	X		
Laboratory certified for at least one total coliform method and one fecal coliform or *E. coli* method	X		

Element	Yes	No	Comments
Laboratory certified for a second total coliform method, if one method cannot be used for some drinking waters	X		
Laboratory that enumerates heterotrophic bacteria (i.e., HPC) for compliance with the Surface Water Treatment Rule certified for the Pour Plate Method	X		**HPC is not used for SDWA Compliance Purposes**
Absorbent pads, when used, saturated with liquid medium and excess removed			N/A
Water sample shaken vigorously (about 25 times) before analysis	X		
QC If no total coliform-positive results occur during a quarter, laboratory performs coliform procedure using a known coliform-positive, fecal coliform- and/or *E. coli*-positive control to spike the sample			N/A
Sample volume analyzed for total coliforms in drinking water is 100 ± 2.5 mL	X		
Media			
Dehydrated or prepared media manufactured commercially used (strongly recommended)	X		
Dehydrated media stored in cool dry location and caked or discolored dehydrated media discarded	X		
QC Laboratory media preparation records include: - date of preparation - type of medium - lot number - sterilization time and temperature - final pH - technician's initials	 X X X X X X		
QC For liquid media prepared commercially, the following are recorded: - date received - type of medium - lot number - pH verification			N/A
QC Liquid media prepared commercially discarded by manufacturer's expiration date			N/A
QC Each new lot of dehydrated and prepared commercial medium checked before use with positive and negative culture controls and results recorded	X		
QC Each new batch of laboratory-prepared medium checked before use with positive and negative culture controls and results recorded	X		
Prepared plates refrigerated in sealed plastic bags or containers not longer than two weeks, with bag or container dated with preparation or expiration date	X		
Loose-cap tubes of broth stored at <30°C no longer than two weeks, tightly capped tubes no longer than 3 months at <30°C	X		
Refrigerated medium incubated at room temperature overnight before use and discarded if growth observed			N/A CORRECT.
QC Parallel testing performed between a newly approved test procedure and another EPA-approved procedure for several months and/or several seasons (recommended)			N/A

Element	Yes	No	Comments
5.2 Membrane Filter (MF) Technique (for total coliforms in drinking water)	X*		***Not used in SDWA Compliance Analysis**
Media			
M-Endo broth or agar or LES Endo agar in single step or enrichment technique used	X		
Ethanol not denatured	X		
Medium prepared in sterile flask and dissolved using boiling water bath or hot plate with stir bar	X		**Boiling Water Bath**
Medium not boiled	X		
LES Endo agar medium pH 7.2 ± 0.2 M-Endo medium pH 7.2 ± 0.1	X		
MF broth refrigerated no longer than 96 hours, poured MF agar plates no longer than 2 weeks, ampuled M-Endo broth as per manufacturer's expiration date	X		
Uninoculated media discarded if growth or surface sheen observed	X		
QC Sterility check conducted on each funnel in use at beginning and end of each filtration series (filtration series ends when 30 minutes or more elapse between sample filtrations)	X		
QC If sterility control indicates contamination, all data rejected and another sample requested	X		
Funnels rinsed with two or three 20-30 mL portions of sterile rinse water after each sample filtration to prevent carry-over	X		
Inoculated medium incubated at 35° ± 0.5°C for 22-24 hours	X		
Samples resulting in confluent or too numerous to count (TNTC) growth invalidated unless total coliforms detected (if laboratory performs verification test before invalidation and test is total coliform-positive, sample is reported as such, but if test is total coliform-negative, sample is invalidated)	X		
Sample not invalidated if membrane filter contains at least one sheen colony	X		
All sheen colonies verified (up to a maximum of five) using either single strength (LB) or (LTB) and single strength (BGLBB) or an EPA-approved cytochrome oxidase and beta-galactosidase rapid test procedure	X		
When picking individual colonies, up to five red questionable sheen colonies and/or red non-sheen colonies verified to include different types or entire MF surface is swabbed	X		
When EC medium or EC medium + MUG used, colonies transferred by employing one option specified by 141.21 (f)(5)	X		
Swab used to transfer presumptive total coliform-positive culture can inoculate up to three different media (e.g., EC medium, LTB, and BGLBB in that order)	X		
5.3 Multiple Tube Fermentation Technique (MTF or MPN) (for total coliforms in drinking water)	X		When used instead of Colilert?
Total sample volume of 100 mL examined by test configuration found in 141.21 (f)(3) or Appendix G	X		
Media			
LTB used in presumptive test and BGLBB in confirmed test	X		
LB used if system conducts at least 25 parallel tests between this medium and LTB and demonstrates false-positive rate and false-negative rate for total coliforms of less than 10%, with comparison documented and records retained			**N/A**

Element	Yes	No	Comments
LTB pH 6.8 ± 0.2	X		
BGLBB pH 7.2 ± 0.2	X		
Test medium concentration adjusted to compensate for sample volume so resulting medium single strength after sample addition	X		
If single 100 mL sample volume used, inverted vial replaced with acid indicator	X		
Medium autoclaved at 121°C for 12-15 minutes	X		
Inverted vials in sterile medium free of bubbles and at least one-half to two-thirds covered after water sample added	X		
Refrigerated sterile MTF media incubated overnight at room temperature before use, with tubes/bottles showing growth and/or bubbles discarded			N/A
Prepared broth media stored in dark at <30°C for no longer than 3 months in screw-cap tubes/bottles, two weeks for those with loose-fitting closures	X		
Media discarded if evaporation exceeds 10% of original volume	X		
Inoculated medium incubated at 35°C ± 0.5°C for 24 ± 2 hours	X		
If no gas or acid detected, inoculated medium incubated for another 24 hours	X		
All samples showing turbid culture (i.e., heavy growth, opaque) in the absence of gas/acid production invalidated and another sample collected from the same location (if laboratory performs confirmed test on turbid culture and confirmed test is total coliform-positive, sample reported as such, but if total coliform-negative, sample is invalidated)	X		
All 24- and 48-hour gas-positive or acid-positive tubes confirmed using BGLBB	X		
Completed Test not required			N/A
When MTF test used on water supplies that have a history of confluent growth or TNTC by the MF procedure, all presumptive tubes with heavy growth without gas/acid production submitted to confirmed test and fecal coliform/*E. coli* test to check for coliform suppression	X		
5.4 Presence-Absence (P-A) Coliform Test (for drinking water)			N/A
Medium			
When six-times formulation strength medium used, medium filter-sterilized, not autoclaved			N/A
Medium autoclaved for 12 minutes at 121°C with total time in autoclave less than 30 minutes and with space between bottles			N/A
Medium pH 6.8 ± 0.2			N/A
Prepared medium stored in the dark at <30°C for no longer than 3 months			N/A
Stored medium discarded if evaporation exceeds 10% of original volume			N/A
100 mL sample inoculated into P-A culture bottle			N/A

Element	Yes	No	Comments
Medium incubated at 35° ± 0.5°C and observed for yellow color (acid) after 24 and 48 hours			N/A
Yellow cultures confirmed in BGLBB and fecal coliform/*E. coli* test conducted			N/A
Non-yellow turbid culture in P-A medium invalidated and another sample obtained from the same location (if confirmed test performed and sample is total coliform-positive, sample is reported as such, but if confirmed test is negative, sample invalidated)			N/A
5.5 Fecal Coliform Test (using EC Medium for fecal coliforms in drinking or source water, or A-1 Medium for fecal coliforms in source water only)	X		
EC medium used to determine whether total coliform-positive culture taken from distribution system contains fecal coliforms, in accordance with Total Coliform Rule	X		
EC medium used to enumerate fecal coliforms in source water, in accordance with Surface Water Treatment Rule, using cultures transferred from each total coliform-positive tube	X*		***Not performed on a routine basis, but do have the capability.**
Three sample volumes (10, 1, and 0.1 mL) and 5 or 10 tubes/sample volume used	X*		***Not performed on a routine basis, but do have the capability.**
Autoclaved at 121°C for 12-15 minutes	X		
Medium pH 6.9 ± 0.2	X		
Inverted vials free of bubbles and at least one-half to two-thirds covered after sample added	X		
Tubes with loose-fitting closures used within two weeks, tightly closed screw-cap tubes no longer than 3 months when held in the dark at <30°C	X		
Refrigerated medium incubated at room temperature overnight before use and tubes with growth or bubbles in vials discarded			N/A
Alternatively, A-1 Medium used to enumerate fecal coliforms in source water, in accordance with Surface Water Treatment Rule			N/A
A-1 medium not used for drinking water samples			N/A
Three sample volumes of source water (10, 1, and 0.1 mL) and 5 or 10 tubes/sample volume used			N/A
Autoclaved at 121°C for 10 minutes			N/A
Medium pH 6.9 ± 0.1			N/A
Inverted vials free of air bubbles and at least one-half to two-thirds covered after water sample added			N/A
Loose-cap tubes stored in dark at room temperature no longer than 2 weeks, tightly closed screw-cap tubes no longer than 3 months when held in the dark at <30°C			N/A
Water level in water bath above upper level of medium in culture tubes	X		

Element	Yes	No	Comments
EC Medium incubated at 44.5°C ± 0.2°C for 24 ± 2 hours	X		
A-1 Medium incubated at 35°C ± 0.5°C for 3 hours, then at 44.5°C ± 0.2°C for 21 ± 2 hours			N/A
Any gas detected in inverted vial considered fecal coliform positive	X		
5.6 Chromogenic/Fluorogenic Substrate Tests (MMO-MUG Test [Colilert] for total coliforms in source water and total coliforms and *E. coli* in drinking water; Colisure Test for total coliforms and *E. coli* in drinking water)	X		
Media			
Purchased from commercially available source only	X		
Media protected from light	X		
Colisure medium refrigerated until use, brought to room temperature before adding sample			N/A
Each lot of medium checked for autofluoresence before use with 366-nm ultraviolet light with 6 watt bulb	X		
Medium which exhibits faint fluorescence discarded and another lot used	X		
Medium plus sample which exhibits color change before incubation discarded and another batch of medium used	X		
QC Each lot of medium checked by inoculating sterile water containing the medium with a MUG-positive *E. coli* strain, a MUG-negative coliform, and a non-coliform and analyzing them	X		
If Quanti-Tray or Quanti-Tray 2000 test used with Colilert medium, sealer checked monthly to determine leakage	X		
Glass bottles that contain inoculated medium checked with 366-nm ultraviolet light source with 6 watt bulb and discarded if fluorescence observed before incubation	X		
For enumeration of total coliforms in source water with Colilert Test, 5 or 10 tube MTF, Quanti-Tray, or Quanti-Tray 2000 used for each sample dilution tested	X		
For chromogenic/fluorogenic substrate test only, sterile dechlorinated tap water, deionized water, or distilled water used as dilution water	X		
For determining presence of total coliforms in drinking water by chromogenic/fluorogenic substrate test, 10 tubes each containing 10 mL water sample or single vessel containing 100 mL sample used	X		
For Colilert Test:	X		
Sample incubated at 35° ± 0.5° for 24 hours (for Colilert-18 test, sample incubated 18 hours)	X		
Yellow color in medium equal to or greater than reference comparator indicates total coliform presence	X		
Medium with yellow color lighter than comparator and incubated for another 4 hours (28 hours total)	X		
Yellow color in medium lighter than comparator incubated for 28 hours recorded as negative	X		

Element	Yes	No	Comments
For Colisure Test:			N/A
Sample incubated at 35° ± 0.5°C for 28 to 48 hours			N/A
Total coliform positive sample indicates color change from yellow to magenta			N/A
For *E. coli* determination, UV lamp (366-nm, 6-watt) shone on total coliform-positive bottles/tubes in darkened room with blue fluorescence indicating *E. coli* presence	X		
QC Air-type incubators tested to determine time necessary for cold 100 mL water sample (or set of 100 mL water samples) to reach incubation temperature of 35oC, ensuring specified incubation time at that temperature is followed	X		
Colilert/Colisure Test not used to confirm total coliforms on membrane filters	X		
Colilert/Colisure Test not used to confirm total coliforms in MTF or P-A tests	X		
5.7 EC Medium + MUG (for *E. coli*)			N/A
Total coliform-positive culture transferred to EC medium + MUG			N/A
Medium			
MUG added to EC medium before autoclaving or commercially available EC + MUG used			N/A
Final MUG concentration 50 µg/mL			N/A
Medium pH 6.9 ± 0.2			N/A
Inverted vial omitted (optional)			N/A
Test tubes and autoclaved medium checked for autofluorescence before use with 366-nm UV light			N/A
If fluorescence exhibited, non-fluorescing tubes or another lot of medium that does not fluoresce used or MUG-positive (*E. coli*) and a MUG-negative (e.g. uninoculated) control included for each analysis			N/A
Prepared medium in tubes with loose-fitting closures used within two weeks, or three months for tightly closed screw-cap tubes when held in the dark at <30°C			N/A
Uninoculated medium with growth discarded			N/A
QC Each lot of commercially prepared medium and each batch of laboratory-prepared medium checked by inoculating LTB with positive and negative culture controls, incubating at 35oC ± 0.5oC for 24 hours and then transferring to EC Medium + MUG for further incubation at 44.5oC ± 0.2oC for 24 hours, with results read and recorded			N/A
Water level of water bath above upper level of medium			N/A
Incubated at 44.5° ± 0.2°C for 24 ± 2 hours			N/A
Fluorescence checked using UV lamp (366-nm) with 6 watt bulb in a darkened room			N/A
5.8 Nutrient Agar + MUG Test (for *E. coli*)			N/A
Medium			

that is used to follow up on MTF ⊕'s.

Medium autoclaved in 100 mL volumes at 121°C for 15 minutes			N/A
Element	**Yes**	**No**	**Comments**
MUG added to Nutrient Agar before autoclaving or Nutrient Agar + MUG purchased commercially			N/A
Final MUG concentration 100 µg/L			N/A
Medium pH 6.8 ± 0.2			N/A
Medium in petri dishes stored refrigerated in plastic bag or tightly closed container and used within two weeks			N/A
Refrigerated sterilized medium incubated at room temperature overnight and plates with growth discarded			N/A
QC Quality of medium lot/batch evaluated by filtering or spot-inoculating positive and negative control cultures onto membrane filter on M-Endo medium, incubating at 35oC for 24 hours, then transferring filter to NA + MUG and further incubating at 35oC for 4 hours, with results read and recorded			N/A
Filter containing total coliform colony(ies) transferred to surface of Nutrient Agar + MUG medium			N/A
Before incubation, presence of each sheen colony marked on petri dish lid with permanent marker, and lid and base marked to realign lid when removed			N/A
For total coliform verification test, portion of colony transferred with needle before or after NA + MUG incubation			N/A
Alternatively, membrane filter surface swabbed with sterile cotton swab after 4 hour incubation and transferred to total coliform verification test			N/A
Inoculated medium incubated at 35 ± 0.5°C for 4 hours			N/A
Fluorescence checked using UV lamp (366 nm) with 6 watt bulb in a darkened room, with any fluorescence in halo around sheen colony considered positive for *E. coli*			N/A
5.9 Heterotrophic Plate Count for enumerating heterotrophs in drinking water	X*		*Not used in SDWA Drinking Water Analysis
Pour Plate Method used for enumerating heterotrophic bacteria in drinking water and for testing reagent grade water	X		
For systems granted a variance from Total Coliform Rule's maximum contaminant level, any method in Standard Methods used with R2A medium for enumerating heterotrophic bacteria in drinking water			N/A
Media (plate count agar [tryptone glucose extract agar] and R2A agar)			
Plate count agar pH 7.0 ± 0.2	X		
R2A agar pH 7.2 ± 0.2			N/A
(For Pour Plate Method) melted agar tempered at 44-46°C in waterbath before pouring, held no longer than 3 hours, and melted only once	X		
(For Spread Plate Method) 15 mL of R2A medium or other medium poured into petri dish and solidified			N/A
Refrigerated medium in bottles or screw-capped tubes stored for up to 6 months, petri dishes with medium for up to 2 weeks (one week for R2A prepared petri dishes)	X		

Element	Yes	No	Comments
Table plates obtained for most potable waters by plating 1.0 mL and/or 0.1 mL volume of undiluted sample	X		
At least duplicate plates per dilution used	X		
(For Pour Plate Method)	X		
Sample pipetted aseptically into bottom of petri dish and then 12-15 mL tempered melted agar added	X		
Sample mixed with spillage avoided	X		
After solidification on level surface, plates inverted and incubated at 35°C ± 0.5°C for 48 ± 3 hours	X		
Plates stacked no more than four high	X		
(For Spread Plate Method)			
0.1 or 0.5 mL of sample or dilution pipetted onto surface of pre-dried agar plate and inoculum spread over entire agar surface using sterile bent glass rod			N/A
Inoculum absorbed completely before plates inverted and incubated at 20-28°C for 5-7 days			N/A
(For Membrane Filter Technique)			N/A
Volume filtered to yield between 20-200 colonies			N/A
Filter transferred to petri dish containing 5 mL solidified R2A medium and incubated at 20-28°C for 5-7 days			N/A
Petri dishes with loose-fitting lids placed in container with close fitting lid and moistened paper towels			N/A
Colonies counted using stereoscopic microscope at 10-15X magnification			N/A
(For Pour Plate and Spread Plate Techniques)			
Colonies counted manually using dark field colony counter	X		
Only plates with 30 to 300 colonies counted, except for plates inoculated with 1.0 mL of undiluted sample	X		
Fully automatic colony counters not used			N/A
QC Medium sterility verified by pouring final control plate and data rejected if control contaminated	X		
5.10 Membrane Filter Technique (for enumerating total coliforms in source water)	X*		***Not used in SDWA Compliance Analysis but have capability.**
Same as Section 5.2, Membrane Filter Technique (for total coliforms in drinking water), except invalidation does not apply	X		
Appropriate sample dilutions used to yield 20 to 80 total coliform colonies per membrane	X		
Initial counts adjusted based upon verified data			N/A
QC If two or more analysts available, each counts total coliform colonies on same membrane monthly and agree within 10%	X		

5.11 Multiple Tube Fermentation Technique (for enumerating total coliforms in source water)	**X***		***Not used for SDWA Compliance analysis but do have the capability. Previously used for Recreational Waters (Beaches)**
Element	**Yes**	**No**	**Comments**
At least three series of 5 tubes each with appropriate sample dilutions of source water used	X		
Same as Section 5.3, Multiple Tube Fermentation Technique (for total coliforms in drinking water) except on sample invalidation	X		
All samples invalidated which produce turbid growth in the absence of gas/acid production in LTB or LB and another sample obtained, which may be tested using another method			**N/A**
Alternatively, confirmed test performed on turbid culture in the absence of gas/acid production and, if total coliform-positive, most probable number reported, or if total coliform-negative, sample invalidated and another requested	X		
5.12 Fecal Coliform Membrane Filter Procedure (for enumerating fecal coliforms in source water)	**X***		***Not used for SDWA Compliance Analysis but have capability.**
Medium			
m-FC broth (with or without agar) sterilized by bringing to boiling point, not autoclaved	X		
Medium final pH 7.4 ± 0.2	X		
Prepared medium refrigerated and broth discarded after 96 hours, poured agar medium in petri dishes after 2 weeks	X		
Uninoculated medium discarded if growth observed	X		
Sample volumes yield 20-60 fecal coliform colonies per membrane for at least one dilution	X		
QC Funnels rinsed with two or three 20-30 mL portions of sterile rinse water after each sample filtration to prevent carry-over	X		
QC Sterility checked at beginning and end of each filtration series and all data rejected from affected samples and resampling requested if controls contaminated	X		
Inoculated medium incubated at 44.5°C ± 0.2°C for 24 ± 2 hours	X		
QC If two or more analysts available, each counts fecal coliform colonies on same membrane monthly and counts agree within 10%	X		
6. SAMPLE COLLECTION, HANDLING, AND PRESERVATION			
6.1 Sample Collector			
Trained in aseptic sampling procedures and, if required, approved by appropriate regulatory authority or designated representative	X		
6.2 Sampling			
Sample representative of water distribution system	X		
Water taps used for sampling free of aerators, strainers, hose attachments, mixing type faucets, and purification devices	X		
Cold water tap used	X		
Service line cleared before sampling by maintaining steady water flow for at least 2 minutes	X		

At least 100 mL sample volume collected, allowing one inch air space in container	X		
Sample information form completed immediately after sample collection	X		
Element	**Yes**	**No**	**Comments**
Source water representative of supply, collected not too far intake at a reasonable distance from shore	X		
6.3 Sample Icing			
Samples held at <10°C during transit to laboratory (recommended for drinking water, required for source water)		X	
6.4 Sample Holding/Travel Time			
Time from sample collection to initiation of analysis for total coliforms, fecal coliforms, or *E. coli* does not exceed 30 hours for drinking water samples	X		
Time from sample collection to initiation of analysis for total coliforms and fecal coliforms in source water and heterotrophic bacteria in drinking water does not exceed 8 hours		X	**Samples exceeding 8 hours indicated Not Valid for SDWA Compliance Reporting**
All samples analyzed on day of receipt by laboratory, unless laboratory receives sample late in day and then refrigerates sample overnight and begins analysis within holding time	X		
6.5 Sample Information Form			
Entered on sample information form in indelible ink:	X		
- name of system (PWSS identification number if available)	X		
- sample identification (if any)	X		
- sample site location	X		
- sample type (e.g. routine, repeat, raw or process)	X		
- date and time of collection	X		
- analysis required	X		
- disinfectant residual	X		
- name of sampler and organization (if not water system)	X		
- sampler's initials	X		
- person(s) transporting sample from system to laboratory (if not sampler)	X		
- transportation condition (e.g. <10°C, protection from sunlight), if shipper used, shipping records available	X		
- any remarks	X		
6.6 Chain-of-Custody			
Applicable regulations followed by collectors and laboratory	X		
7. QUALITY ASSURANCE			
Written QA Plan prepared, followed, and available for inspection	X		
8. RECORDS AND DATA REPORTING			
8.1 Legal Defensibility			
Compliance monitoring data legally defensible by keeping thorough and accurate records	X		
QA plan and/or SOPs describe policies and procedures used by facility for record retention and storage	X		
Chain-of-custody procedures used if samples expected to become part of legal action	X		

8.2 Maintenance of Records			
Microbiological analyses records kept by or accessible to laboratory for at least 5 years or until next certification data audit completed, whichever is longer	X		
Client water system notified before disposal of records	X		
Element	**Yes**	**No**	**Comments**
8.3 Sampling Records			
Data recorded in ink with changes lined through such that original entry visible and changes initialed and dated	X		
Sampling records include: - sample information form, from Section 6.5 - date and time of sample receipt by laboratory - name of laboratory person receiving sample - if any deficiency in sample condition noted, sample, at a minimum, flagged - if sample transit time exceeds 30 hours (8 hours for source water samples), sample tagged	 X X X X X		
8.4 Analytical Records			
Data recorded in ink with changes lined through such that original entry visible and with changes initialed and dated	X		
Analytical records include: - laboratory sample identification - date and time analysis begins - laboratory and person(s) responsible for performing analysis - analytical technique or method used - all items marked QC - results of analysis	 X X X X X X		
8.5 Preventive Maintenance			
Preventive maintenance and repair records for all instruments and equipment kept for 5 years	X		
9. ACTION RESPONSE TO LABORATORY RESULTS			
9.1 Testing Total Coliform-Positive Cultures			
For the Total Coliform Rule, all total coliform positive cultures tested for presence of either fecal coliforms or *E. coli*	X		
9.2 Notification of Positive Results			
For Total Coliform Rule, proper authority notified promptly by laboratory of positive total coliform, fecal coliform or *E. coli* results	X		
Total coliform positive result based on confirmed phase for MTF Technique and P-A Coliform Test or verified test for MF Technique (no requirement for confirmation of positive Colilert/Colisure, fecal coliform or *E. coli* tests)	X		
9.3 Invalidation of Total Coliform-Negative Sample			
For Total Coliform Rule, proper authority notified when results indicate non-coliforms may have interfered with total coliform analysis	X		
Countable plates obtained for most potable waters by plating 1.0 mL and/or 0.1 mL volume of undiluted sample			
At least duplicate plates per dilution used			
(For Pour Plate Method)			

Element	Yes	No	Comments
Sample pipetted aseptically into bottom of petri dish and then 12-15 mL tempered melted agar added			
Sample mixed with spillage avoided			
After solidification on level surface, plates inverted and incubated at 35°C ± 0.5°C for 48 ± 3 hours			
Plates stacked no more than four high			
(For Spread Plate Method)			
0.1 or 0.5 mL of sample or dilution pipetted onto surface of pre-dried agar plate and inoculum spread over entire agar surface using sterile bent glass rod			
Inoculum absorbed completely before plates inverted and incubated at 20-28°C for 5-7 days			
(For Membrane Filter Technique)			
Volume filtered to yield between 20-200 colonies			
Filter transferred to petri dish containing 5 mL solidified R2A medium and incubated at 20-28°C for 5-7 days			
Petri dishes with loose-fitting lids placed in container with close fitting lid and moistened paper towels			
Colonies counted using stereoscopic microscope at 10-15X magnification			
(For Pour Plate and Spread Plate Techniques)			
Colonies counted manually using dark field colony counter			
Only plates with 30 to 300 colonies counted, except for plates inoculated with 1.0 mL of undiluted sample			
Fully automatic colony counters not used			
QC Medium sterility verified by pouring final control plate and data rejected if control contaminated			
5.10 Membrane Filter Technique (for enumerating total coliforms in source water)			
Same as Section 5.2, Membrane Filter Technique (for total coliforms in drinking water), except invalidation does not apply			
Appropriate sample dilutions used to yield 20 to 80 total coliform colonies per membrane			
Initial counts adjusted based upon verified data			
QC If two or more analysts available, each counts total coliform colonies on same membrane monthly and agree within 10%			
5.11 Multiple Tube Fermentation Technique (for enumerating total coliforms in source water)			
At least three series of 5 tubes each with appropriate sample dilutions of source water used			
Same as Section 5.3, Multiple Tube Fermentation Technique (for total coliforms in drinking water) except on sample invalidation			

All samples invalidated which produce turbid growth in the absence of gas/acid production in LTB or LB and another sample obtained, which may be tested using another method			
Alternatively, confirmed test performed on turbid culture in the absence of gas/acid production and, if total coliform-positive, most probable number reported, or if total coliform-negative, sample invalidated and another requested			
Element	**Yes**	**No**	**Comments**
5.12 Fecal Coliform Membrane Filter Procedure (for enumerating fecal coliforms in source water)			
Medium			
m-FC broth (with or without agar) sterilized by bringing to boiling point, not autoclaved			
Medium final pH 7.4 ± 0.2			
Prepared medium refrigerated and broth discarded after 96 hours, poured agar medium in petri dishes after 2 weeks			
Uninoculated medium discarded if growth observed			
Sample volumes yield 20-60 fecal coliform colonies per membrane for at least one dilution			
QC Funnels rinsed with two or three 20-30 mL portions of sterile rinse water after each sample filtration to prevent carry-over			
QC Sterility checked at beginning and end of each filtration series and all data rejected from affected samples and resampling requested if controls contaminated			
Inoculated medium incubated at 44.5°C ± 0.2°C for 24 ± 2 hours			
QC If two or more analysts available, each counts fecal coliform colonies on same membrane monthly and counts agree within 10%			
6. SAMPLE COLLECTION, HANDLING, AND PRESERVATION			
6.1 Sample Collector			
Trained in aseptic sampling procedures and, if required, approved by appropriate regulatory authority or designated representative			
6.2 Sampling			
Sample representative of water distribution system			
Water taps used for sampling free of aerators, strainers, hose attachments, mixing type faucets, and purification devices			
Cold water tap used			
Service line cleared before sampling by maintaining steady water flow for at least 2 minutes			
At least 100 mL sample volume collected, allowing one inch air space in container			
Sample information form completed immediately after sample collection			
Source water representative of supply, collected not too far intake at a reasonable distance from shore			
6.3 Sample Icing			
Samples held at <10°C during transit to laboratory (recommended for drinking water, required for source water)			

6.4 Sample Holding/Travel Time			
Time from sample collection to initiation of analysis for total coliforms, fecal coliforms, or *E. coli* does not exceed 30 hours for drinking water samples			
Time from sample collection to initiation of analysis for total coliforms and fecal coliforms in source water and heterotrophic bacteria in drinking water does not exceed 8 hours			
Element	**Yes**	**No**	**Comments**
All samples analyzed on day of receipt by laboratory, unless laboratory receives sample late in day and then refrigerates sample overnight and begins analysis within holding time			
6.5 Sample Information Form			
Entered on sample information form in indelible ink: - name of system (PWSS identification number if available) - sample identification (if any) - sample site location - sample type (e.g. routine, repeat, raw or process) - date and time of collection - analysis required - disinfectant residual - name of sampler and organization (if not water system) - sampler's initials - person(s) transporting sample from system to laboratory (if not sampler) - transportation condition (e.g. <10°C, protection from sunlight), if shipper used, shipping records available - any remarks			
6.6 Chain-of-Custody			
Applicable regulations followed by collectors and laboratory			
7. QUALITY ASSURANCE			
Written QA Plan prepared, followed, and available for inspection			
8. RECORDS AND DATA REPORTING			
8.1 Legal Defensibility			
Compliance monitoring data legally defensible by keeping thorough and accurate records			
QA plan and/or SOPs describe policies and procedures used by facility for record retention and storage			
Chain-of-custody procedures used if samples expected to become part of legal action			
8.2 Maintenance of Records			
Microbiological analyses records kept by or accessible to laboratory for at least 5 years or until next certification data audit completed, whichever is longer			
Client water system notified before disposal of records			
8.3 Sampling Records			
Data recorded in ink with changes lined through such that original entry visible and changes initialed and dated			
8.4 Analytical Records			
Data recorded in ink with changes lined through such that original entry visible and with changes initialed and dated			

Analytical records include: - **laboratory sample identification** - **date and time analysis begins** - **laboratory and person(s) responsible for performing analysis** - **analytical technique or method used** - **all items marked QC** - **results of analysis**			
Element	**Yes**	**No**	**Comments**
8.5 Preventive Maintenance			
Preventive maintenance and repair records for all instruments and equipment kept for 5 years			
9. ACTION RESPONSE TO LABORATORY RESULTS			
9.1 Testing Total Coliform-Positive Cultures			
For the Total Coliform Rule, all total coliform positive cultures tested for presence of either fecal coliforms or *E.coli*			
9.2 Notification of Positive Results			
For Total Coliform Rule, proper authority notified promptly by laboratory of positive total coliform, fecal coliform or *E. coli* results			
Total coliform positive result based on confirmed phase for MTF Technique and P-A Coliform Test or verified test for MF Technique (no requirement for confirmation of positive Colilert/Colisure, fecal coliform or *E. coli* tests)			
9.3 Invalidation of Total Coliform-Negative Sample			
For Total Coliform Rule, proper authority notified when results indicate non-coliforms may have interfered with total coliform analysis			

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL SCIENCE CENTER
Analytical Services and Quality Assurance Branch
701 Mapes Road
Fort Meade, MD 20755-5350

September 4, 2003

Andrea M. Labik, Sc. D.
Director
West Virginia Department of Health & Human Resources
Bureau for Public Health
Office of Laboratory Services
167 11th Avenue
South Charleston, West Virginia 25303-1137

Dear Dr. Labik:

The assessment team has completed the review of the corrective action reports for the on-site assessment of the WV's Laboratory Certification Program (8/21/03) and the WV Health Laboratory (8/29/03), prepared in response to our on-site assessment reports (dated July 16, 2003 for the program review and July 28, 2003 for the laboratory review). We have the following comments:

Laboratory Review (findings for Inorganic Chemistry, no findings for Microbiology):

General:

Corrective action for finding #1: EPA's Office of Ground Water and Drinking Water (OGWDW, Cincinnati), has pointed out that drinking water analyses (compliance analyses) for WV's Office of Environmental Health Services (OEHS) must be performed by laboratories that are certified by EPA or by a State other than WV. We need to have copies of the signed certificates from other state/s to complete our records. We had underlined this part of the finding in our report, however the listing provided with the corrective action report includes a number of laboratories that list only WV certification. It is suggested that this item needs to be added to the agenda for discussion with the OEHS, e.g., Ms. Linda Keller, Assistant Manager of Regulatory Development and Compliance. OGWDW cites the Federal Register for this requirement (2002 CFR 141.11 vi on page 564).

Corrective action for finding #2: The response is fine, we will add a copy of the "Inorganic Chemistry Analysis Report" to our files when received.

Corrective action for finding #3: The response is fine, we will add a copy of updated SOP to our files when received.

Corrective action for finding #4: The response is fine, we will add a copy of the example

instrument printout with analyst's initial/date to our files when received.

Corrective action for finding #5: The response is fine.

Program Review (Comments from EPA were provided via E-mail (8/28/03) with the following open items listed in **bold print**):

Finding #1. Concerning on-site laboratory inspections, the response and plan look fine. **Please routinely provide copies of the inspection reports to the EPA review team as each is finalized. This will help track progress with the projected schedule.**

Finding #2. Concerning www.wvdhhr.org, the response is fine.

Finding #3. Concerning out-of-state laboratories, the response is fine. We understand the legal issues of dropping laboratories currently certified. However, consideration should be given to not renewing these laboratories after their current cycle. **Please forward the decision/s on this issue from the meeting of the Office of Laboratory Services and the Office of Environmental Health Services.**

Finding #4. Concerning the scope of certification/approvals for the WV Lab Cert Program, **please forward the decision/s on this issue from the meeting of the Office of Laboratory Services and the Office of Environmental Health Services.**

Finding #5. Concerning "Additional Suggestions", please provide information regarding item "a" and "b", which concern microbiology. This information was received on 8/29/03 with a follow-up return E-Mail (9/2/03), urging additional clerical help for microbiology to afford the organization of out-of-state laboratory certification records comparable with the filing system for the in-state laboratories.

Upon receipt of the listed information/materials we will issue an updated certification report for inoganic chemistry and will close out the on-site assessment (laboratory and program office). If you have any questions please call me at 410-305-2653 or E-mail (Slayton.joe@epa.gov).

Sincerely,

Joseph Slayton
Technical Director

cc:

Robin Costas (3ES20)
David Russell (3ES20)
Richard Rogers (3WP22)
Charles Jones, Jr. (3ES10)
Wanda Johnson (3WP22)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL SCIENCE CENTER
Analytical Services and Quality Assurance Branch
701 Mapes Road
Fort Meade, MD 20755-5350

July 28, 2003

Andrea M. Labik, Sc. D.
Director
West Virginia Department of Health & Human Resources
Bureau for Public Health
Office of Laboratory Services
167 11th Avenue
South Charleston, West Virginia 25303-1137

Dear Dr. Labik:

The assessment team has competed the reports resulting from the on-site SDWA review of your laboratory conducted on June 24-25, 2003. We request that you provide a written corrective action plan to address the listed findings within 30 days of receipt of this report (August 29, 2003).

If you have any questions please call me at 410-305-2653 or E-mail (Slayton.joe@epa.gov).

Sincerely,

Joseph Slayton
Technical Director

cc:

Robin Costas (3ES20)
David Russell (3ES20)
Richard Rogers (3WP22)
Charles Jones, Jr. (3ES10)
Wanda Johnson (3WP22)

Final On-Site Laboratory Evaluation Report (SDWA)

Inorganic Chemistry

(Rev. 7-25-03)

West Virginia Department of Health and Human Resources
Bureau for Public Health
Office of Laboratory Services
Environmental Chemistry Laboratory Section
4710 Chimney Drive, Suite G
Charleston, WV 25302

June 24-25, 2003

Surveyed by:

Joseph Slayton
Robin Costas

U.S.E.P.A. - Region III
Analytical Services and Quality Assurance Branch
701 Mapes Road
Ft. Meade, Maryland 20755-5350

A. Introduction:

On June 24-25, 2003 an on-site inspection of inorganic chemistry was conducted of the West Virginia Department of Health and Human Resources, Bureau for Public Health, Office of Laboratory Services. The chemical analyses of drinking water samples is conducted at a separate location, Environmental Chemistry Laboratory Section, 4710 Chimney Drive, Suite G, Charleston, WV 25302. The purpose of this inspection was to determine the capability of the laboratory to perform its mission as it relates to the Safe Drinking Water Act (SDWA). The laboratory was represented by Dr. Andrea Labik, Sc.D, Office of Laboratory Services Director, Charlotte Billingsley, Associate Director, Dr. Wayne Morganroth, Laboratory Section Supervisor, Mr. Larry Duffield, Chemist II (analysis of metals), and Mr. Greg Young, Chemist II (analysis of inorganic, non-metal analytes).

This inspection was conducted by: Robin Costas, Chemist (evaluation of metals) and Joseph Slayton, Technical Director (evaluation of inorganic, non-metals); USEPA, Region III, Analytical Services and Quality Assurance Branch, 701 Mapes Road, Ft. Meade, Maryland 20755-5350.

The laboratory lost the capability to perform the analyses of organic contaminants for SDWA in 1997. These analyses are performed by commercial laboratories certified by West Virginia. Efforts are underway to regain this analytical capability. Any assistance by the EPA Region 3 Water Protection Division would be greatly appreciated, as expertise in organic analyses would not only provide a valuable technical assistance for the SDWA laboratories in WV, but also greatly improve WV ability to oversee and certify these laboratories. WV requested that this on-site review include the review of alkalinity, cyanide and pH to expand the scope of their inorganic certification. The listing in Section E of this report, "Contaminant Method Information" is the regulated and "unregulated" parameters for which the laboratory is requesting SDWA certification and approval.

A number of the inorganic analytes require "cool, 4°C" preservation (alkalinity, conductivity, cyanide, nitrite, nitrate, TDS, Turbidity, Sulfate). All inorganic analytes with the exception of nitrite are not cooled during transport to the laboratory. The samples collected by Environmental Health Services are described as not being for compliance purposes but for engineering purposes, e.g., double check on the distribution system. As a corrective action for the last on-site assessment, the laboratory routinely labels the results for such unpreserved samples as "Sample >4 Celsius, Not Valid for SDWA Compliance Reporting".

SDWA samples for total nitrate are routinely analyzed and reported as a sum for (NO2+NO3)-N. The State uses a concentration of 0.5 mg/L to "trigger" the immediate re-sampling and re-analysis, i.e., this may indicate an NO2-N concentration of 0.5 mg/L which has a maximum concentration limit of 0.5 mg/L.

B. Personnel:

The courtesy and professionalism of the laboratory personnel was greatly appreciated by the inspection team. It was apparent from the excellent record keeping and quality control procedures, that the laboratory personnel are dedicated to achieving analytical excellence.

C. Proficiency Testing (PT) Samples:

The laboratory data for Proficiency Testing samples for the years 2000 thru 2003 were discussed during the on-site evaluation. The laboratory results were "Acceptable" for all regulated inorganic parameters reported with the exception of the following "Not Acceptable" results: April 2003 - conductivity (successful makeup audit in June 2003); January 2001 - turbidity, manganese, aluminum (successful makeup audit July 2001). **This is an excellent record of performance and indicates the laboratory's results are accurate and reliable.**

D. Analytical Method References:

The list of parameters in Section E were audited during this inspection with the associated methodology cited as follows:

(SM) - Standard Methods for the Examination of Water and Wastewater, 18th edition.
(EPA83) - Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79/83.
(EPA93) - Determination of Inorganic Substances in Environmental Samples, Aug 1993, EPA/600/R-93/100.
(EPA94) - Methods for the Determination of Metals in Environmental Samples, May 1994, EPA/600/R-94/111.
(CLADW) - Manual for the Certification of Laboratories Analyzing Drinking Water, March 1997, EPA 815-B-97-001.

E. Contaminant Method Information: *Primary Inorganic Chemicals, Parameters in the Lead and Copper Rule, Sodium and Turbidity:*

Parameter	Method	Instrumentation
Antimony	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Arsenic	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Barium	ICP (EPA94, 200.7)	Varian Liberty 100
Beryllium	GFAAS (SM 3113B)	Varian SpectraAA - 400 Plus
Cadmium	GFAAS (SM 3113B)	Varian SpectraAA - 400 Plus
Chromium	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Copper	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Lead	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Mercury	Cold Vapor AA (EPA94, 245.1)	PE-50B W/PE CVAAS
Selenium	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Sodium	Flame AA (SM 3111B)	Varian SpectrAA - 400 Plus
Thallium	GFAAS (EPA94, 200.9)	Perkin-Elmer 5100, HGA 600

Primary Inorganic Chemicals, Parameters in the Lead and Copper Rule, Sodium and Turbidity (Continued):

Parameter	Method	Instrumentation
Alkalinity	Titration (SM 2320B)	25 mL Buret
Conductance	Conductance (SM 2510B)	Model 31 Conductivity Bridge
Cyanide	Ion Selective Electrode (SM 4500CN-F)	Orion Model EA 940 Meter Orion ISE and Double Junction Reference
Fluoride	Ion Chromatography (EPA93, 300.0)	Dionex-120
Nitrate	Automated Cadmium (EPA93, 353.2)	Technicon Auto-Reduction Analyzer II
Nitrite	Automated Cadmium (EPA93, 353.2)	Technicon Auto-Reduction Analyzer II
pH	Electrometric (EPA83, 150.1)	Corning 430 Meter & 3-In-One Electrode
Turbidity	Nephelometric (EPA93, 180.1)	Hach 2100A Turbidimeter

Optional Primary Contaminants:

Parameter	Method	Instrumentation
Nickel	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Total Hardness	Titration (SM 2340C)	25 mL Buret

Secondary Contaminants:

Parameter	Method	Instrumentation
Aluminum	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Iron	Flame AA (SM 3111B)	Varian SpectrAA - 400 Plus
Manganese	Flame AA (SM 3111B)	Varian SpectrAA - 400 Plus
Silver	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Zinc	Flame AA (SM 3111B)	Varian SpectrAA - 400 Plus
Chloride	Ion Chromatography (EPA93, 300.0)	Dionex-120
Sulfate	Ion Chromatography (EPA93, 300.0)	Dionex-120
TDS	Gravimetric (SM 2540C)	Gelman A/E GF Filters; Blue M Oven; Mettler AG-245

F. Calibration & Detection Information:

Maximum Contaminant Level (MCL), Method Detection Limit (MDL), Reporting Limit (RL as defined by the WV Laboratory.)

Primary Contaminants; Lead and Copper Rule; Sodium and Turbidity:

Contaminant	***Calibration Standards*** **(mg/L)**	**MCL(mg/L)**	**MDL(ug/L)**	**RL(ug/L)**
Metals:				
Antimony	BLK; 0.003; 0.006; 0.012	0.006	0.84	3
Arsenic	BLK; 0.002; 0.005; 0.010; 0.020	0.050	1.05	2
Barium	BLK; 0.50; 5.00; 10.0	2.00	0.0003	5
Beryllium	BLK; 0.0002; 0.0005; 0.001; 0.002	0.004	0.05	0.2
Cadmium	BLK; 0.001; 0.002; 0.004	0.005	0.12	1
Chromium	BLK; 0.001; 0.0025; 0.005; 0.010	0.100	0.51	1
Copper	BLK; 0.001; 0.0025; 0.005; 0.010	1.3*	0.32	1
Lead	BLK; 0.001; 0.0025; 0.005; 0.010	0.015*	0.24	1
Mercury	BLK; 0.0002; 0.0005; 0.001; 0.002	0.002	0.064	0.2
Selenium	BLK; 0.002; 0.005; 0.010	0.050	1.01	2
Sodium	BLK; 2.0; 5.0;10.0;15.0;20.0	20.0+	0.08	2000
Thallium	BLK; 0.002; 0.004; 0.008	0.002	0.65	1
Non-Metals:				
Cyanide	BLK; 0.05; 1.25; 0.2; 0.3; 0.4	0.2	3.6	50
Fluoride	BLK; 0.1; 0.2; 0.50; 1.00	4.0	6	100
Nitrate	BLK; 0.05; 0.10; 0.25; 0.50; 1.00	10.0	3.6	50
Nitrite	BLK; 0.05; 0.10; 0.25; 0.50; 1.00	1.0	4.8	50
	Cd Column Check Standard (1.0)			
pH	4.0; 7.0; 10.0 (pH Units)	[6.5-8.5]	-	-
TDS	NIST Traceable Std. Wts.	[500]	-	-

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* "Action Level"
+ "Reportable Level"
[ ] = Suggested MCL (SMCL)

G. Quality Control (QC) Procedures:

The laboratory follows a "Manual of Quality Assurance, Environmental Chemistry", (QA Manual, Rev. 2003). This document includes: QA plan and policy statement; laboratory organization; employee job descriptions and responsibilities; sampling instructions; sample handling procedures; reporting of results; chain of custody (formal internal tracking is limited to cases which may involve litigation); quality assurance monitoring; analytical procedures; data reduction; data verification; data validation; data reporting; preventive maintenance; internal QC

checks; precision and accuracy; sample rejection policy; and proficiency testing. A partial list of the QC procedures observed during this inspection included: calibration records for thermometers; on-going temperature records of refrigerators and drying ovens; analysis of an external (2nd source) QC sample with each analytical batch; method detection limit determinations; duplicate analysis (precision measure); spike analysis (accuracy/recovery measure); blank analysis/batch; check standards at 10% frequency (instrument drift measure); instrument "run logs"; cadmium column reduction efficiency measured and recorded; standard weights employed to verify balance performance; detailed/clearly written and quickly retrieved analytical records; on-going compilation and charting of QC check results; and the resistance/conductivity of lab pure water recorded each day of use.

H. Analytical Deviations:

Deviations are those laboratory techniques not in compliance with the mandatory requirements of the analytical methods cited above or with the 1997 EPA Manual for the Certification of Laboratories Analyzing Drinking Water, Fourth Edition, EPA/815-B-97-001, (CLADW). In addition, procedures/techniques, which are considered critical by the inspectors for the production of quality data are cited as "Good Laboratory Practices" (GLP). The following changes are required for the laboratory to be in compliance with the SDWA program (40 CFR 142.10).

General:

1. The principle WV state SDWA laboratory must maintain capability and certification for all the contaminants specified in the State Primary Drinking Water Regulations, p. E-1 CLADW, unless the State has been granted waivers for compliance monitoring of these analytes or has contracted with laboratories which are SDWA certified (by EPA or by a state other than WV such as Lancaster Laboratories, Pennsylvania) for these analytes. A listing of commercial laboratories that are employed by the State program for SDWA compliance monitoring for the analytes not measured at the WV Lab and their current SDWA Certification status (signed copies of the certificates from other state/s) is necessary to complete our records. Also, in the future as new certificates are issued to these laboratories, electronic copies should be routinely forward to the certification officer.

2. The inorganic non-metal results are routinely qualified "not valid for SDWA compliance reporting". However, on several occasions the results were not flagged (samples 30039-turbidity; 30021-alkalinity, pH, sulfate, and TDS). It is suggested that the "#" code be added to all temperature dependent analytes which are not chilled during transport as a part of the "Inorganic Chemistry Analysis Report" template. In addition, the "@" indicating exceedance of holding time should be added directly to the form for pH results.

pH:

3. The results from duplicate pH analyses should not be averaged unless the complex mathematical procedure for taking the average of logarithmic numbers (GLP) is used. It is suggested that instead of using an average, the pH result with the greatest difference from 6.5-8.5 be reported.

Ion Chromatography:

4. The bench record (instrument printout) needs include the initials of the analyst and date to supplement the initials and date printed by the software (GLP).

Turbidity:

5. A check standard (IPC) is required to be analyzed at the beginning, at 10% frequency and at the end of the analyses set (EPA 180.1).

I. Recommendations:

These items are offered as suggestions (not required):

a. Extensive work has been performed with the routine conductance of MDL studies. When next performed consideration should be given to increasing the spike level to help assure reasonable percent recoveries of the analytes (for example 60-140% or other target limit set by the laboratory). The MDL should be about 3 fold lower than the reporting limit (ie., the concentration of lowest calibration standard). The reporting limit should be less than the SDWA Maximum Contaminant Limit (MCL) for the analyte.

b. Although, the QA Manual is extensive and well written, the next time that the manual is updated the following items described in the CLADW should be considered and procedures documented: a process to determine data quality objectives (driven by use of data by clients); listing of all SOPs (title, date, status) used in the laboratory; traceability of calibration material (primary and second source); certificate retention for reference weights, reference thermometers and reference materials; create "QS Components Table" which lists all parameters analyzed indicating dates for last MDL, IDP, SOP, PT, and internal review; laboratory policy for calculating MDL and IDP data; laboratory policy for dropping outlier data from MDLs, IDPs, and calibrations (should rely directly on observations of laboratory accidents and statistical tests for outliers); frequency of recertification of reference weights and thermometers; action limits for the calibration of mechanical pipets; the listings of corrective actions for failed QC checks should be expanded to include what should be done when acceptable QC cannot be achieved (e.g., do not report the data or qualify the result as an estimate with an indication of the direction of bias); pollution prevention (steps taken to reduce the harmful impact of analyses); policy for the analyses of PT samples (i.e., analyzed as a routine samples using the same QC frequency and

limits); management system review (yearly review of Quality System by upper management);

c. Although, the Laboratory QM describes "internal audits", these reviews are not being performed. Internal review is regarded as a key component of a laboratory's quality system to ensure continuous improvement, so these audits should be initiated and conducted on a set schedule. In addition, data verification, should be routinely performed (review and spot checking of 10% of the data with sign off by a second analyst).

d. Consideration should be given to the purchase of cyanide stock material, as the titration procedure to standardize the material is very technique dependent.

e. A separate refrigerator is recommended for the storage of samples separate from calibration and QC materials.

f. Consideration should be given to analyzing MDLs at 1/year frequency when the methods state "should" for more frequent MDL studies. It is suggested that fortified blanks carried through the entire method at the quantitation level be performed yearly as a more critical method performance study (e.g., recoveries should be 40-160% until laboratory determined limits are developed).

g. The practice of recording the sample temperatures in the determination of conductance should be continued since it was determined by the laboratory to be the source of PT difficulty.

h. Sample tags are date-stamped upon receipt and log-in by the laboratory. The initials of the sample custodian should be recorded on the tag as well.

i. It is suggested that the frequency of balance verifications should be increased to be done with each analyses when weight critical measurements are made (preparation of calibration stocks, gravimetric analyses, such as TDS, mechanical pipet checks, and when small quantities < 100 mg are measured). The reference weights should be stored in a desiccator.

j. The newly initiated procedure for recording of the calibration of thermometers in a log book (previously recorded only on a thermometer tag) should be continued.

k. At the time of this assessment no samples had been analyzed for cyanide. When samples arrive for this analysis, the field removal of residual chlorine must be checked and recorded (preservation information).

l. The laboratory should develop a records management system, i.e., each SOP, notebook, QM, etc., is assigned a unique number and the status of the documents are recorded, e.g., initiation date, status (draft, in progress, complete, active, archived).

m. Efforts to update the inorganic non-metal SOPs to include details of corrective actions for failed QC should be continued. The tabulation in the SOP for metals may prove a useful model.

n. A reference should be provided in future SOP updates to indicate the source of the QC limits. If these are based on "in-house limits" (cases when the reference methods do not specify limits), the rationale should be provided and supporting data should be collected to allow a systematic determination.

o. A reagent log should be created for the metals analytical work.

p. In instances where standards are used passed their expiration date, a second source audit should be used that has not expired.

q. It is apparent that a great deal of time and coordination is needed to maintain the metals laboratory because of the number of instruments involved. Consideration should be given to obtaining an ICP-MS which could replace most, if not all, of current instrumentation for a more efficient work environment.

J. Certification Status:

Certified: Upon correction of the items listed as findings, "Certified" will be recommended for:

Metals:
Arsenic; Antimony; Barium; Beryllium; Cadmium; Chromium; Copper; Lead; Mercury; Nickel, Selenium; Sodium; and Thallium.

Inorganic Non-Metals:
Alkalinity; Conductance; Cyanide; Fluoride; Nitrate; Nitrite; pH; Turbidity; and Hardness.

Secondary Analytes: Upon correction of the items listed as findings, "Fully Acceptable" will be recommended for:

Metals:
Aluminum; Iron; Manganese; Silver; and Zinc.

Inorganic Non-Metals:
Chloride; Sulfate; and TDS.

K. Inspectors:

Joseph Slayton	7/28/03 Date
Robin Costas	7.28.03 Date

From: Charles Robinette
To: Tom Ong
Date: 6/25/2003 10:15:00 AM
Subject: Re: Question?

I hope I can answer this so it isn't confusing-
Under the total coliform rule, compliance samples are taken in the distribution system, and in WV, that definitely means, not source water, because we require treatment.

Under the surface water treatment rule, we have developed a GUDI (ground water under the direct influence of surface water) determination protocol, which requires ground water systems to sample the source water for a period of time for this determination. This might be considered "compliance", but EED doesn't, because it is essentially for a special study.

I think where EPA is coming from, is that some states allow surface sources not to filter, and one of the monitoring requirements for those systems is at least weekly monitoring of the source water. We require all surface systems to filter, thus we do not require source water sampling.

>>> Tom Ong 06/25/03 09:38AM >>>
Question?

Does EED consider any source water samples as compliance?

We are having our EPA inspection and the question about source water has come up again.

Thanks.

Tom

CC: Linda Keller

Mark Rodgers

(513) 569 - 7225

FAX: 513 - 487 - 2512

Tom's Phone Query

lab#	code	city	col date	recd date	anal date	name/co	Sanitarian or Eng'eer	city	st	zip	collector	PWS #	sample pt	Total	Fecal	Ecoli	Rpt Date
13487	BJ	MONROE	5/28/2003	5/29/2003	5/29/2003	SWEET SPRINGS WA	☐	GAP MILL	WV	0	WICKLINE	5492006	RAW GM	108.6		<1.0	5/30/2003
9132	BJ	MONROE	1/28/2003	1/30/2003	1/30/2003	SWEET SPRINGS WA	☑	GAP MILL	WV	0	WICKLINE	5492006	RAW BB	<1.0			1/31/2003
13932	BJ	MONROE	6/4/2003	6/5/2003	6/5/2003	CHESTNUT RIDGE P	☐	BRUCETO	WV	26525	MILLER	9931007	WELL HOUSE	579.4		19.7	6/6/2003
13931	BJ	MONROE	6/4/2003	6/5/2003	6/5/2003	CHESTNUT RIDGE P	☐	BRUCETO	WV	26525	MILLER	9931007	WELL HOUSE	>2419.2		21.1	6/6/2003
13930	BJ	MONROE	6/4/2003	6/5/2003	6/5/2003	CHESTNUT RIDGE P	☐	BRUCETO	WV	26525	MILLER	9931007	WELL HOUSE	>2419.2		28.8	6/6/2003
13929	BJ	MONROE	6/4/2003	6/5/2003	6/5/2003	CHESTNUT RIDGE P	☐	BRUCETO	WV	26525	MILLER	9931007	WELL HOUSE	>2419.2		21.1	6/6/2003
9734	BJ	MONROE	2/18/2003	2/19/2003	2/19/2003	SWEET SPRINGS WA	☐	GAP MILL	WV	0	WICKLINE	5492006	RAW AP	<1.0			2/20/2003
9920	BJ	MONROE	2/24/2003	2/25/2003	2/25/2003	SWEET SPRINGS CO	☐	GAP MILL	WV	24941	WILCHER	3200000	LOAD OUT	<1.0			2/26/2003
10190	BJ	MONROE	3/3/2003	3/4/2003	3/4/2003	SWEET SPRINGS VA	☐	GAP MILL	WV	0	WICKLINE	5492006	RAW WATER TAP	<1.0			3/5/2003
13489	BJ	MONROE	5/28/2003	5/29/2003	5/29/2003	SWEET SPRINGS WA	☐	GAP MILL	WV	0	WICKLINE	5492006	RAW AP	<1.0			5/30/2003
13488	BJ	MONROE	5/28/2003	5/29/2003	5/29/2003	SWEET SPRINGS WA	☐	GAP MILL	WV	0	WICKLINE	5492006	RAW L	12.1		<1.0	5/30/2003
11415	BI	MONROE	4/2/2003	4/3/2003	4/3/2003	SWEET SPRINGS	☐	GAP MILL	WV	0	WICKLINE	5492006	RAW L	<10			4/4/2003
11416	BI	MONROE	4/2/2003	4/3/2003	4/3/2003	SWEET SPRINGS	☐	GAP MILL	WV	0	WICKLINE	5492006	RAW GM	<10			4/4/2003
11417	BI	MONROE	4/2/2003	4/3/2003	4/3/2003	SWEET SPRINGS	☐	GAP MILL	WV	0	WICKLINE	5492006	RAW AP	<10			4/4/2003
11870	BJ	MONROE	4/14/2003	4/15/2003	4/15/2003	SWEET SPRINGS WA	☐	GAP MILL	WV	24941	WICKLINE	5492006	RAW AP	<1.0			4/16/2003
8640	BI	OHIO	1/13/2003	1/14/2003	1/14/2003	CITY OF WHEELING	☑	WHEELIN	WV	26003	JOHNSON	3303516	FILTRATION PLAN	4106		464	1/15/2003
11418	BI	OHIO	4/2/2003	4/3/2003	4/3/2003	CITY OF WHEELING	☑	WHEELIN	WV	26003	JOHNSON	3303516	FILTRATION PLAN	857		110	4/4/2003
12367	BJ	PENDLET	4/29/2003	4/30/2003	4/30/2003	THE MOUNTAIN INST	☐	CHARLES	WV	26241	MT	9936034	SPRING BOX 6813	365.4		<1.0	5/1/2003
12304	BJ	PENDLET	4/28/2003	4/29/2003	4/29/2003	THE MOUNTAIN INST	☐	ELKINS	WV	26241	MP	9936034	SPRING BOX	31.3		<1.0	4/30/2003
14534	BJ	PENDLET	6/16/2003	6/17/2003	6/17/2003	JAMES A RUDDLE	☑	FRANKLIN	WV	26807	HARR	0	BASEMENT	<1.0			6/18/2003
9923	BJ	PENDLET	2/24/2003	2/25/2003	2/25/2003	RT 33 SPRING	☑	FRANKLIN	WV	0	HARR	0	KAMMER KIT	4.2		<1.0	2/26/2003
12213	BJ	PENDLET	4/23/2003	4/24/2003	4/24/2003	THE MOUNTAIN INST	☐	ELKINS	WV	26241	MARTIN	9936034	SPRING BOX	13.2		<1.0	4/25/2003
13486	BJ	PENDLET	5/28/2003	5/29/2003	5/29/2003	CHARLES W HARPER	☑	FRANKLIN	WV	26807	HARR	0	RR	43.9		<1.0	5/30/2003
11773	BJ	POCAHON	4/9/2003	4/11/2003	4/11/2003	SENECA STATE FOR	☐	DUNMORE	WV	24934	WAGNER	0	WELL HEAD	<1.0		<1.0	4/12/2003
11772	BJ	POCAHON	4/9/2003	4/11/2003	4/11/2003	SENECA STATE FOR	☐	DUNMORE	WV	24934	WAGNER	0	WELL HEAD	<1.0		<1.0	4/12/2003
11771	BJ	POCAHON	4/9/2003	4/11/2003	4/11/2003	SENECA STATE FOR	☐	DUNMORE	WV	24934	WAGNER	0	WELL HEAD	<1.0		<1.0	4/12/2003
11770	BJ	POCAHON	4/9/2003	4/11/2003	4/11/2003	SENECA STATE FOR	☐	DUNMORE	WV	24934	WAGNER	0	WELL HEAD	<1.0		<1.0	4/12/2003
13111	BJ	POCAHON	5/19/2003	5/20/2003	5/20/2003	MOUNTAIN QUEST IN	☑	NA	WV	0	MCCOY	0	SPRING	980.4		325.5	5/21/2003
13053	BJ	POCAHON	5/15/2003	5/16/2003	5/16/2003	HILLSBORO	☑	NA	WV	0	HAWNARI	0	PLANT RW TAP	<1.0			5/17/2003
11774	BJ	POCAHON	4/9/2003	4/11/2003	4/11/2003	SENECA STATE FOR	☐	DUNMORE	WV	24934	WAGNER	0	WELL HEAD	<1.0		<1.0	4/12/2003
9798	BJ	POCAHON	2/19/2003	2/20/2003	2/20/2003	ALPINE BROOK MHP	☐	SLATY FO	WV	26291	MCKENNE	3303814	WELL 2	6.3		<1.0	2/21/2003
8739	BJ	POCAHON	1/15/2003	1/16/2003	1/16/2003	ALPINE BROOK MHP	☐	SLATYFO	WV	26291	MCKENNE	3303814	WELL 2	3.1		<1.0	1/17/2003
11271	BI	POCAHON	3/31/2003	4/1/2003	4/1/2003	SHOWSHOE	☐	ND	WV	0	HAWK	3303808	PLANT TAP	63		<10	4/2/2003
13112	BJ	POCAHON	5/19/2003	5/20/2003	5/20/2003	MOUNTAIN QUEST IN	☑	NA	WV	0	MCCOY	0	TEST WELL	>2419.2		23.3	5/21/2003
12745	BJ	POCAHON	5/7/2003	5/8/2003	5/8/2003	GREENBANK SCH	☐	ND	WV	0	HAWK	9938019	RAW WATER TAP	<1.0			5/9/2003
11769	BJ	POCAHON	4/9/2003	4/11/2003	4/11/2003	SENECA STATE FOR	☐	DUNMORE	WV	24934	WAGNER	0	WELL HEAD	<1.0		<1.0	4/12/2003
11776	BJ	POCAHON	4/9/2003	4/11/2003	4/11/2003	SENECA STATE FOR	☐	DUNMORE	WV	24934	WAGNER	0	WELL HEAD	<1.0		<1.0	4/12/2003
11777	BJ	POCAHON	4/9/2003	4/11/2003	4/11/2003	SENECA STATE FOR	☐	DUNMORE	WV	24934	WAGNER	0	WELL HEAD	2.0		<1.0	4/12/2003
8481	BJ	POCAHON	1/9/2003	1/11/2003	1/11/2003	ALPINE BROOK MHP	☐	SLATY FO	WV	26291	MCKENNE	3303814	2 WELL	UNSAT			1/11/2003
8441	BJ	POCAHON	1/8/2003	1/9/2003	1/9/2003	ALPINE BROOK MHP	☐	SLATY FO	WV	26241	MCKENNE	3303814	WELL 2	8.7		1.0	1/10/2003
8866	BJ	POCAHON	1/21/2003	1/22/2003	1/22/2003	ALPINE BROOK MHP	☐	SLATYFO	WV	0	MCKENNE	3303814	WELL 2	1.0		<1.0	1/23/2003
11775	BJ	POCAHON	4/9/2003	4/11/2003	4/11/2003	SENECA STATE FOR	☐	DUNMORE	WV	24934	WAGNER	0	WELL HEAD	<1.0		<1.0	4/12/2003
8282	BJ	POCAHON	1/6/2003	1/7/2003	1/7/2003	ALPINE BROOK MHP	☐	SLATYFO	WV	26291	MCKENNE	3303814	WELL 2	3.1		<1.0	1/8/2003
8473	BJ	POCAHON	1/10/2003	1/11/2003	1/11/2003	ALPINE BROOK MHP	☐	SLATFOR	WV	26291	MCKENNE	3303814	2 WELL	4.1		1.0	1/12/2003
8286	BJ	PRESTON	1/6/2003	1/7/2003	1/7/2003	BNA QUIK MART	☑	NA	WV	0	MCCOY	9939132	EXISTING WELL	>200.5		<1.0	1/8/2003
13250	BJ	PRESTON	5/21/2003	5/22/2003	5/22/2003	ADAM GOWER	☐	KINGWOO	WV	26537	JAG	0	COAL TRAIN RD	>2419.2		<1.0	5/23/2003
9366	BJ	PRESTON	2/4/2003	2/5/2003	2/5/2003	NEWBURG	☑	NA	WV	0	COBB	3303928	RW TAP	<1.0			2/6/2003
13933	BI	PRESTON	6/4/2003	6/5/2003	6/5/2003	RIVERVIEW LOUNGE	☑	NA	WV	0	HAWNARI	9939155	RAW TAP	609		10	6/6/2003
8283	BJ	PRESTON	1/6/2003	1/7/2003	1/7/2003	BNA QUIK MART	☑	NA	WV	0	MCCOY	9939132	GARAGE WELL	20.7		<1.0	1/8/2003
8285	BJ	PRESTON	1/6/2003	1/7/2003	1/7/2003	BNA QUIK MART	☑	NA	WV	0	MCCOY	9939132	EXISTING WELL	>200.5		<1.0	1/8/2003
8989	BI	PRESTON	1/23/2003	1/25/2003	1/25/2003	TUNNELTON	☑	NA	WV	0	COBB	3303918	WELL 2	<10.0			1/26/2003
14911	BJ	PRESTON	6/23/2003	6/24/2003	6/24/2003	BLENN HARDESTY	☐	TERRA AL	WV	26764	GH	0	SPRING				
8370	BJ	PRESTON	1/7/2003	1/8/2003	1/8/2003	JAMES TAYLOR	☑	REEDSVIL	WV	26547	SPAHR	0	WELL	>200.5		<1.0	1/9/2003
10653	BI	PRESTON	3/11/2003	3/12/2003	3/12/2003	COUNTRY HIDEAWA	☐	TUNNELT	WV	26444	STONE	0	KIT	<10.0		<10.0	3/13/2003
8284	BJ	PRESTON	1/6/2003	1/7/2003	1/7/2003	BNA QUIK MART	☑	NA	WV	0	MCCOY	9939132	GARAGE WELL	13.7		<1.0	1/8/2003
14281	BI	PUTNAM	6/11/2003	6/11/2003	6/11/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	MILES	3304011	LARCK RES	317		<10	6/12/2003
9736	BJ	PUTNAM	2/18/2003	2/19/2003	2/19/2003	TOM JENNINGS	☑	HURRICA	WV	25526	LYONS	0	PLAY HOUSE RR	<1.0			2/20/2003
14761	BJ	PUTNAM	6/23/2003	6/23/2003	6/23/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	POPLAR FK				
10015	BI	PUTNAM	2/26/2003	2/26/2003	2/26/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	POPLAR FORK	8664.0		146.0	2/27/2003
14762	BJ	PUTNAM	6/23/2003	6/23/2003	6/23/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	WATER PLANT				
9703	BI	PUTNAM	2/18/2003	2/18/2013	2/18/2003	HURRICANE MUNICIP	☑	NA	WV	0	COBB	3304005	PLANT LAB	5475		246	2/19/2003
13925	BI	PUTNAM	6/5/2003	6/5/2003	6/5/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	MILES	3304011	POPLAR FK	>24192		2481	6/6/2003
14760	BJ	PUTNAM	6/23/2003	6/23/2003	6/23/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	LARCK				
13926	BI	PUTNAM	6/5/2003	6/5/2003	6/5/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	MILES	3304011	LARCK RES	332		62	6/6/2003
12674	BJ	PUTNAM	5/7/2003	5/7/2003	5/7/2003	SOUTH PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	POPLAR FORK	>2419.2		>2419.	5/8/2003
12675	BJ	PUTNAM	5/7/2003	5/7/2003	5/7/2003	SOUTH PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	LARCK	4.1		<1.0	5/8/2003
10016	BI	PUTNAM	2/26/2003	2/26/2003	2/26/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	LARCK	85.0		<10.0	2/27/2003
13500	BI	PUTNAM	5/29/2003	5/29/2003	5/29/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	INGHRAM	3304011	LARCK RES	2.0		<1.0	5/30/2003
14550	BJ	PUTNAM	6/17/2003	6/17/2003	6/17/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	PLANT	<1.0			6/18/2003
14549	BJ	PUTNAM	6/17/2003	6/17/2003	6/17/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	POPLAR FK	>2419.2		>2419.	6/18/2003
14548	BJ	PUTNAM	6/17/2003	6/17/2003	6/17/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	LARCK	166.9		91.0	6/18/2003
14280	BI	PUTNAM	6/11/2003	6/11/2003	6/11/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	MILES	3304011	POPLAR FK	7701		435	6/12/2003

Tom's Phone Query

6/24/2003

lab#	code	cty	col date	recd date	anal date	name/co	Sanitarian or Eng'eer	city	st	zip	collector	PWS #	sample pt	Total	Fecal	Ecoli	Rpt Date
11954	8J	BARBOUR	4/15/2003	4/16/2003	4/16/2003	CITY OF PHILIPPI	☑	NA	WV	0	SATTERFI	3300104	RW TAP	770.1		29.2	4/17/2003
14264	8J	BARBOUR	6/10/2003	6/11/2003	6/11/2003	TETER CREEK LAKE	☑	NA	WV	0	SATTERFI	9901021	HAND WELL PUM	<1.0			6/12/2003
11008	8I	BOONE	3/21/2003	3/21/2003	3/21/2003	BOONE RALEIGH PS	☑	NA	WV	0	COBB	3300315	BIG COAL RIVER	2613		173	3/22/2003
11019	8I	BRAXTON	3/21/2003	3/22/2003	3/22/2003	WV AWC GASSAWAY	☑	NA	WV	0	MCCOY	0	RAW TAP	2755		74	3/23/2003
13855	8I	BRAXTON	6/3/2003	6/4/2003	6/4/2003	SUGAR CREEK	☑	NA	WV	0	HAWNARI	0	RW PLANT	5867		243	6/5/2003
8594	8J	CABELL	1/13/2003	1/14/2003	1/14/2003	ST MARYS MEDICAL	☐	HUNTINGT	WV	25702	BURKS	3300608	WELL HEAD	1.0		<1.0	1/15/2003
9550	8J	CABELL	2/10/2003	2/11/2003	2/11/2003	MELISSA DEUTSCH	☐	HUNTINGT	WV	25701	STACEY	0	BASEMENT FLOO	>2419.2		816.4	2/12/2003
9549	8J	CABELL	2/10/2003	2/11/2003	2/11/2003	ST MARYS HOSPITAL	☐	HUNTINGT	WV	25702	BURKS	3300608	WELL HEAD	<1.0			2/12/2003
12533	8I	CABELL	5/5/2003	5/6/2003	5/6/2003	DEBBIE ELLISON	☑	HUNTINGT	WV	25705	ELLISON	0	ND	>24192		>24192	5/7/2003
13031	8J	CABELL	5/14/2003	5/15/2003	5/15/2003	MILTON WATER	☑	NA	WV	0	COBB	3300604	PLANT RAW	>2419.2		248.1	5/16/2003
14263	8J	CABELL	6/10/2003	6/11/2003	6/11/2003	ST MARYS MED CEN	☐	HUNTINGT	WV	25702	BURKS	3300608	WELL HEAD	51.7		<1.0	6/12/2003
8135	8J	CABELL	1/2/2003	1/3/2003	1/3/2003	FRANK LINVILLE	☑	BARBOUR	WV	25504	GRAY	0	KIT	980.4		<1.0	1/4/2003
9796	8J	CABELL	2/19/2003	2/20/2003	2/20/2003	MILTON WATER	☑	MILTON	WV	0	ELLISON	0	FAUCET INSIDE P	>2419.2		>2419.	2/21/2003
8442	8J	CABELL	1/8/2003	1/9/2003	1/9/2003	JOHN SAGUINTO	☑	BABOURS	WV	25504	GRAY	0	OUT FAUCET	LAB AC			1/9/2003
11355	8I	CALHOUN	4/1/2003	4/2/2003	4/2/2003	GRANTSVILLE	☑	NA	WV	0	TROYAN	3300701	RW TAP PLANT	557		98	4/3/2003
10382	8J	CALHOUN	3/5/2003	3/6/2003	3/6/2003	CALHOUN GILMER C	☐	GRANTSVI	WV	26147	BALL	9907004	RW 2	1.0		<1.0	3/7/2003
13703	8I	CLAY	6/2/2003	6/3/2003	6/3/2003	CLAY CO HEALTH DE	☑	CLAY	WV	0	MORTON	0	MORTON BRIDGE	>24192		2382	6/4/2003
13702	8I	CLAY	6/2/2003	6/3/2003	6/3/2003	CLAY CO HEALTH DE	☑	CLAY	WV	0	MORTON	0	NA	>24192		727	6/4/2003
13701	8I	CLAY	6/2/2003	6/3/2003	6/3/2003	CLAY CO HEALTH DE	☑	CLAY	WV	0	MORTON	0	SIZEMORES TP	>24192		19862.	6/4/2003
12866	8J	CLAY	5/12/2003	5/13/2003	5/13/2003	CLAY CO HEALTH DE	☑	CLAY	WV	25043	MORTON	0	LAUREL CK	>2419.2		>2419.	5/14/2003
12865	8J	CLAY	5/12/2003	5/13/2003	5/13/2003	CLAY CO HEALTH DE	☑	CLAY	WV	25043	MORTON	0	EVELYN	>2419.2		686.7	5/14/2003
12864	8J	CLAY	5/12/2003	5/13/2003	5/13/2003	CLAY CO HEALTH DE	☑	CLAY	WV	25043	MORTON	0	MAYSELS BRIDGE	>2419.2		104.6	5/14/2003
9133	8J	GREENBR	1/29/2003	1/30/2003	1/30/2003	ALVON SPRINGS	☑	WHITE SU	WV	0	ELTZROT	0	SPRING BOX	4.2		<1.0	1/31/2003
11875	8J	HANCOCK	4/14/2003	4/15/2003	4/15/2003	WEIRTON STEEL	☑	NA	WV	0	SMITH	9915030	LAB PLANT BASE	>2419.2		548.8	4/16/2003
11226	8I	HANCOCK	3/27/2003	3/28/2003	3/28/2003	NA	☑	NA	WV	0	SMITH	9915028	SPRING ACROSS	52		<10	3/29/2003
10189	8J	HARRISO	3/3/2003	3/4/2003	3/4/2003	MIRACLE MEADOWS	☐	ND	WV	0	HAWK	3301740	PLANT R/W TAP	<1.0			3/5/2003
10920	8I	HARRISO	3/18/2003	3/19/2003	3/19/2003	SALEM	☑	NA	WV	0	HAWRANI	3301720	RW PLANT	259		<10	3/20/2003
10919	8J	HARRISO	3/18/2003	3/19/2003	3/19/2003	SHINNSTON WATER	☑	NA	WV	0	SATTERFI	3301721	RW IN CHEM BLD	517.2		7.4	3/20/2003
11554	8J	JACKSON	4/8/2003	4/8/2003	4/9/2003	ROANE JACKSON TE	☐	NA	WV	0	KOCH	9918002	RW TANK RM	<1.0			4/10/2003
10728	8J	JACKSON	3/13/2003	3/14/2003	3/14/2003	COTTAGEVILLE PSD	☑	NA	WV	0	KOCH	3301804	FINISHED PLANT	A			3/15/2003
10727	8J	JACKSON	3/13/2003	3/14/2003	3/14/2003	COTTAGEVILLE PSD	☑	NA	WV	0	KOCH	3301804	RW PLANT	<1.0			3/15/2003
13724	8J	KANAWHA	6/3/2003	6/3/2003	6/3/2003	ST ALBANS WATER	☑	ST ALBAN	WV	25177	CANTLEY	3302031	PLANT INLET	>2419.2		549.2	6/4/2003
13710	8I	KANAWHA	6/2/2003	6/3/2003	6/3/2003	PRATT WATER	☑	PRATT	WV	25162	HANNA	3302024	PLANT RAW	5867		74	6/4/2003
8443	8I	KANAWHA	1/8/2003	1/9/2003	1/9/2003	ST ALBANS MUNICIP	☑	ST ALBAN	WV	0	COBB	3302031	TREATMENT PLA	2247		96	1/10/2003
8650	8J	KANAWHA	1/14/2003	1/14/2003	1/14/2003	STOCKTON MINE	☐	MAMMOT	WV	25132	MOTUS	9920088	RAW TAP	<1.0			1/15/2003
10763	8I	KANAWHA	3/17/2003	3/17/2003	3/17/2003	LINCOLN PSD	☑	ALUM CK	WV	25003	CANTLEY	3302205	PLANT LAB	1354		41	3/18/2003
9087	8J	KANAWHA	1/28/2003	1/29/2003	1/29/2003	PRATT WATER	☑	PRATT	WV	25067	HANNA	3302024	PLANT	>200.5		101.3	1/30/2003
9093	8I	KANAWHA	1/29/2003	1/29/2003	1/29/2003	CLENDENIN WATER	☑	CLENDENI	WV	25045	COBB	3302010	TP LAB SINK	111		<10	1/30/2003
13725	8J	KANAWHA	6/3/2003	6/3/2003	6/3/2003	LINCOLN PSD	☑	ALUM CRE	WV	25003	CANTLEY	3302205	PLANT INLET	920.8		10.9	6/4/2003
10431	8I	KANAWHA	3/6/2003	3/6/2003	3/6/2003	ST ALBANS WATER	☑	ST ALBAN	WV	25177	CANTLEY	3302031	RAW INLET	1607		121	3/7/2003
10191	8I	LEWIS	3/3/2003	3/4/2003	3/4/2003	JANE LEW PSD	☐	ND	WV	0	COBB	3302102	RAW WATER INLE	3873		313	3/5/2003
13052	8J	LEWIS	5/15/2003	5/16/2003	5/16/2003	MINUTEMAN GROC	☑	NA	WV	0	COBB	0	UTILITY RM RW T	33.1		4.1	5/17/2003
12970	8J	LEWIS	5/13/2003	5/14/2003	5/14/2003	RELAND HEAD STAR	☑	NA	WV	0	COBB	9921045	RW TAP	17.5		<1.0	5/15/2003
11184	8J	LEWIS	3/26/2003	3/27/2003	3/27/2003	ROANOKE ELEM SCH	☐	NA	WV	0	COBB	9921022	HYDRANT	2.0		<1.0	3/28/2003
10316	8J	LEWIS	3/4/2003	3/5/2003	3/5/2003	WV AMC	☑	NA	WV	0	SATTERFI	3302104	RW LAB	344.8		8.6	3/6/2003
10563	8I	LINCOLN	3/10/2003	3/11/2003	3/11/2003	WEST HAMLIN	☑	NA	WV	0	TROYAN	3302203	RAW TREATMENT	754		74	3/12/2003
10461	8J	LINCOLN	3/7/2003	3/7/2003	3/7/2003	STOWERS & SONS G	☑	NA	WV	0	MOTUS	9922047	WELL HOUSE	<1.0			3/8/2003
12159	8I	LINCOLN	4/22/2003	4/23/2003	4/23/2003	LINCOLN	☑	NA	WV	0	COBB	3302205	LAB SINK	12996.5		369	4/24/2003
12742	8J	MARION	5/7/2003	5/8/2003	5/8/2003	FAIRVIEW	☐	ND	WV	0	COBB	3302503	WELL 2	275.5		12.0	5/9/2003
12663	8I	MARION	5/6/2003	5/7/2003	5/7/2003	RIVESVILLE	☑	ND	WV	0	HAWKINS	3302519	FIRST HOUSE BEL	<10.0			5/8/2003
12743	8J	MARION	5/7/2003	5/8/2003	5/8/2003	FAIRVIEW	☐	ND	WV	0	COBB	3302503	WELL 3	1.0		<1.0	5/9/2003
12744	8J	MARION	5/7/2003	5/8/2003	5/8/2003	FAIRVIEW	☐	ND	WV	0	COBB	3302503	WELL 1	1299.65		51.3	5/9/2003
9458	8J	MASON	2/6/2003	2/7/2003	2/7/2003	MASON CO PSD	☐	PT PLEAS	WV	25550	LEF	3302713	LETART WELL 4	9.9		<1.0	2/8/2003
14536	8J	MASON	6/16/2003	6/17/2003	6/17/2003	MASON CO PSD	☐	PT PLEAS	WV	25550	HITE	3302713	NEW WELL 4	<1.0			6/18/2003
11696	8J	MASON	4/9/2003	4/9/2003	4/9/2003	M&G POLYMERS	☑	NA	WV	0	KOCH	9926008	RW TAP	<1.0			4/10/2003
10921	8I	MASON	3/18/2003	3/19/2003	3/19/2003	MASON CO HEALTH	☑	PT PLEAS	WV	25550	FOWLER	0	CREEK	<10			3/20/2003
14738	8J	MASON	6/18/2003	6/20/2003	6/20/2003	MASON CO PSD	☐	PT PLEAS	WV	25550	NIBERT	3302712	LAKIN WELL 2	<1.0			6/21/2003
10672	8J	MASON	3/12/2003	3/12/2003	3/12/2003	MASON CO PSD	☐	NA	WV	0	KOCH	3302712	RW TAP PLANT	<1.0		<1.0	3/13/2003
14535	8J	MASON	6/16/2003	6/17/2003	6/17/2003	MASON CO PSD	☐	PT PLEAS	WV	25550	HITE	3302712	WELL 2	<1.0			6/18/2003
14713	8J	MASON	6/19/2003	6/19/2003	6/19/2003	MASON CO PSD	☐	PT PLEAS	WV	25550	HITE	3302713	LETART 4	7.4		1.0	6/20/2003
14739	8J	MASON	6/18/2003	6/20/2003	6/20/2003	MASON CO PSD	☐	PT PLEAS	WV	25550	HITE	3302713	LETORT WELL 4	9.4		2.0	6/21/2003
14714	8J	MASON	6/19/2003	6/19/2003	6/19/2003	MASON CO PSD	☐	PT PLEAS	WV	25550	HITE	3302712	WELL	<1.0			6/20/2003
13043	8J	MASON	5/15/2003	5/15/2003	5/15/2003	RACINE LOCK/DAM	☑	NA	WV	0	MOTUS	9926032	RW TAP	<1.0			5/16/2003
8141	8J	MCDOWE	1/2/2003	1/3/2003	1/3/2003	ENVIRONMENTAL HE	☑	BECKLEY	WV	25801	SHUFFLE	3302435	WILLIE CLICK	2419.17		4.1	1/4/2003
11956	8I	MCDOWE	4/15/2003	4/16/2003	4/16/2003	FREDDY STEELE	☑	NA	WV	0	STRESS	0	OUTSIDE ROAD DI	>24192		175	4/17/2003
9553	8J	MCDOWE	2/10/2003	2/11/2003	2/11/2003	EDWIN C STRESS	☑	NA	WV	0	STRESS	0	MARISA MUNCYS	>2419.2		2.0	2/12/2003
9552	8I	MCDOWE	2/10/2003	2/11/2003	2/11/2003	EDWIN C STRESS	☑	NA	WV	0	STRESS	0	WILLIE CLICK	1986.28		4.1	2/12/2003
9551	8I	MCDOWE	2/10/2003	2/11/2003	2/11/2003	EDWIN C STRESS	☑	NA	WV	0	STRESS	0	MARISA MUNCY	24192		153	2/12/2003
11957	8I	MCDOWE	4/15/2003	4/16/2003	4/16/2003	FREDDY STEELE	☑	NA	WV	0	STRESS	0	ROADSIDE DITCH	>241920		100	4/17/2003
14481	8J	MCDOWE	6/16/2003	6/17/2003	6/17/2003	AEGER DAIRY BAR	☑	AEGER	WV	0	STRESS	0	PARKING LOT RT	>2419.2		>2419.	6/18/2003
9554	8J	MCDOWE	2/10/2003	2/11/2003	2/11/2003	EDWIN C STRESS	☑	NA	WV	0	STRESS	0	BASEMENT	1732.87		6.3	2/12/2003
12001	8J	MONONG	4/15/2003	4/17/2003	4/17/2003	CHESTNUT RIDGE C	☑	NA	WV	0	HAWNARI	9931000	RW TAP	17.3		<1.0	4/18/2003

Raw Tap.

?

lab#	code	cty	col date	recd date	anal date	name/co	Sanitarian or Eng'eer	city	st	zip	collector	PWS #	sample pt	Total	Fecal	Ecoli	Rpt Date
10332	8I	PUTNAM	3/5/2003	3/5/2003	3/5/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	LARCK	471		<1.0	3/6/2003
13313	8J	PUTNAM	5/23/2003	5/23/2003	5/23/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	INGHRAM	3304011	POPLAR FK	>2419.2		2419.1	5/24/2003
12914	8J	PUTNAM	5/13/2003	5/13/2003	5/13/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	POPLAR FK	>2419.2		>2419.	5/14/2003
12011	8I	PUTNAM	4/17/2003	4/17/2003	4/17/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	RICHARDS	3304011	POPLAR FK RESE	8664		733	4/18/2003
13312	8J	PUTNAM	5/23/2003	5/23/2003	5/23/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	INGHRAM	3304011	LARCK RES	21.3			5/24/2003
10922	8I	PUTNAM	3/19/2003	3/19/2003	3/19/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	LARCK	199		<10	3/20/2003
10923	8I	PUTNAM	3/19/2003	3/19/2003	3/19/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	POPLAR FORK	2481		98	3/20/2003
10667	8I	PUTNAM	3/12/2003	3/12/2003	3/12/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	POPLAR FK	1414.0		31	3/13/2003
12368	8I	PUTNAM	4/30/2003	4/30/2003	4/30/2003	SOUTH PUTNAM PSD	☐	SCOTT DE	WV	25560	RICHARDS	3304011	JONATHAN LARC	63		<10	5/1/2003
8113	8J	PUTNAM	1/2/2003	1/2/2003	1/2/2003	SO PUTNAM PSD	☑	SCOTT DE	WV	0	COBB	3304011	LAB SINK @ TREA	>2419.2		920.8	1/3/2003
10924	8I	PUTNAM	3/19/2003	3/19/2003	3/19/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	GALA IND	A			3/20/2003
10925	8I	PUTNAM	3/19/2003	3/19/2003	3/19/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	D CHAPMAN AUT	A			3/20/2003
13202	8I	PUTNAM	5/21/2003	5/21/2003	5/21/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	DOUGLAS	3304011	POPLAR FK	>24192		644	5/22/2003
13201	8I	PUTNAM	5/21/2003	5/21/2003	5/21/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	DOUGLAS	3304011	JONATHAN LARC	97		<10	5/22/2003
12913	8J	PUTNAM	5/13/2003	5/13/2003	5/13/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	LARCK	95.9		17.1	5/14/2003
12010	8I	PUTNAM	4/17/2003	4/17/2003	4/17/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	RICHARDS	3304011	JONATHAN LARC	131		<10	4/18/2003
12787	8I	PUTNAM	5/9/2003	5/9/2003	5/9/2003	SOUTH PUTNAM PSD	☐	SCOTT DE	WV	25560	INGHEMM	3304011	POPLAR FORK RE	17328.7		1017	5/10/2003
12168	8J	PUTNAM	4/23/2003	4/23/2003	4/23/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	RICHARDS	3304011	POPLAR FK	>2419.2		119.85	4/24/2003
12167	8J	PUTNAM	4/23/2003	4/23/2003	4/23/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	25560	RICHARDS	3304011	JONATHAN LARC	66.3		2.0	4/24/2003
10333	8I	PUTNAM	3/5/2003	3/5/2003	3/5/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	POPLAR FK	3076		161	3/6/2003
13496	8I	PUTNAM	5/29/2003	5/29/2003	5/29/2003	SOUTH PUTNAM PSD	☐	SCOTT DE	WV	0	INGHRAM	3304011	POPLAR FK	36540		309	5/30/2003
12083	8J	PUTNAM	4/21/2003	4/22/2003	4/22/2003	HURRICANE MUNICIP	☑	HURRICA	WV	25526	EDEN	330405	LAB SINK	>2419.2		816.4	4/23/2003
12369	8I	PUTNAM	4/30/2003	4/30/2003	4/30/2003	SOUTH PUTNAM PSD	☐	SCOTT DE	WV	25560	RICHARDS	3304011	POPLAR FK RESE	>24192		2063	5/1/2003
10666	8I	PUTNAM	3/12/2003	3/12/2003	3/12/2003	SO PUTNAM PSD	☐	SCOTT DE	WV	0	LARCK	3304011	LARCK	110		<10.0	3/13/2003
12081	8J	PUTNAM	4/21/2003	4/22/2003	4/22/2003	SO PUTNAM PSD	☑	SCOTT DE	WV	25560	EDEN	3304011	LAB SINK	38.9		<1.0	4/23/2003
10076	8I	RANDOLP	2/27/2003	2/28/2003	2/28/2003	HUTTONSVILLE COR	☑	HUTTONS	WV	0	MCCOY	3304206	RAW TAP	175		10	3/1/2003
12969	8J	RANDOLP	5/13/2003	5/14/2003	5/14/2003	COALTON	☑	NA	WV	0	HAWNARI	3304213	RW PLANT TAP	1.0		<1.0	5/15/2003
13705	8J	RANDOLP	6/2/2003	6/3/2003	6/3/2003	BILL MCLAUGHLIN	☑	BOWDEN	WV	26254	ELMER	0	KIT	<1.0			6/4/2003
8988	8I	RANDOLP	1/24/2003	1/25/2003	1/25/2003	MILL CREEK	☑	NA	WV	0	HAWNERI	3304206	PLANT RAW	265		63	1/26/2003
12898	8J	RANDOLP	5/12/2003	5/13/2003	5/13/2003	NJH	☑	NA	WV	0	HAWNARI	3304213	RW PLANT TAP	45.7		5.2	5/14/2003
12788	8J	RANDOLP	5/9/2003	5/10/2003	5/10/2003	WHITMER WATER AS	☑	NA	WV	0	MCCOY	3304216	NEW WELL	<1.0		<1.0	5/11/2003
12160	8J	RANDOLP	4/22/2003	4/23/2003	4/23/2003	THE MOUNTAIN INST	☐	ELKINS	WV	26241	MARTIN	9936034	SPRING BOX	9.8		<10	4/24/2003
13704	8J	RANDOLP	6/2/2003	6/3/2003	6/3/2003	BILL MCLAUGHLIN	☐	BOWDEN	WV	26254	ELMER	0	KIT	77.1		<1.0	6/4/2003
12082	8J	RANDOLP	4/21/2003	4/22/2003	4/22/2003	J&J RIVER MART	☑	NA	WV	0	COBB	99420	SPRING BOX	>2419.2		<1.0	4/23/2003
11999	8J	RANDOLP	4/15/2003	4/17/2003	4/17/2003	JCS PIZZA	☑	NA	WV	0	COBB	9942092	KIT	<1.0			4/18/2003
13490	8J	RANDOLP	5/28/2003	5/29/2003	5/29/2003	VALLEY HEAD SCHO	☑	NA	WV	0	MCCOY	9942026	RW TAP	<1.0			5/30/2003
12779	8J	RANDOLP	5/8/2003	5/9/2003	5/9/2003	CRAIG R COBB	☑	PHILIPPI	WV	26416	COBB	0	HILLSIDE SPRING	325.5		70.3	5/10/2003
12747	8J	ROANE	5/7/2003	5/8/2003	5/8/2003	SPRING HTS ED CTR	☐	ND	WV	0	KOCH	9944019	WATER PLANT RA	1986.28		43.5	5/9/2003
12013	8J	ROANE	4/17/2003	4/17/2003	4/17/2003	SPENCER WATER W	☑	NA	WV	0	COBB	3304405	FROST FREE SPIG	165.8		7.4	4/18/2003
10981	8J	SUMMERS	3/19/2003	3/20/2003	3/20/2003	FRED NOBLE	☑	ALDERSO	WV	24910	MEADOR	0	TAP	<1.0			3/21/2003
12305	8I	TAYLOR	4/28/2003	4/29/2003	4/29/2003	TAYLOR CO PSD	☑	NA	WV	0	COBB	3304605	RW TAP	10.0		<10	4/30/2003
12664	8I	TUCKER	5/6/2003	5/7/2003	5/7/2003	THOMAS	☑	ND	WV	0	COBB	3304709	RAW WATER TAP	1607		10	5/8/2003
12662	8J	TUCKER	5/6/2003	5/7/2003	5/7/2003	HAMRICK PSD	☑	ND	WV	0	SATTERFI	3304709	RAW WATER TAP	>2419.2		93.2	5/8/2003
10979	8I	WAYNE	3/19/2003	3/20/2003	3/20/2003	TOWN OF WAYNE	☐	NA	WV	0	ADKINS	3305001	PLANT LAB	4352			3/21/2003
9365	8J	WAYNE	2/4/2003	2/5/2003	2/5/2003	FORT GAY WATER	☑	NA	WV	0	COBB	3305004	TUG FK	>2419.2		920.8	2/6/2003
11440	8I	WAYNE	4/3/2003	4/4/2003	4/4/2003	KENOVA	☑	NA	WV	0	TROYAN	3305006	RW PLANT	813		<10	4/5/2003
9924	8J	WAYNE	2/24/2003	2/25/2003	2/25/2003	DEBBIE PERRY	☑	GENOA	WV	25517	HARBISO	0	HAND DUG WELL	3.1		<1.0	2/26/2003
9735	8I	WAYNE	2/18/2003	2/19/2003	2/19/2003	KENOVA MUNICIPAL	☐	XENOVA	WV	25530	SPENCE	3305009	XENOVA PLANT PI	10462.4		369	2/20/2003
12666	8I	WEBSTER	5/6/2003	5/7/2003	5/7/2003	COWEN PSD	☐	COWEN	WV	26206	WAYNE	3305103	GAULEY RIVER W	1793		85	5/8/2003
13700	8I	WEBSTER	6/2/2003	6/3/2003	6/3/2003	COWEN PSD	☐	COWEN	WV	26206	RW	3305103	RIVER INTAKE	1313		1.0	6/4/2003
13538	8J	WEBSTER	5/29/2003	5/30/2003	5/30/2003	HACKER VALLEY	☑	NA	WV	0	MCCOY	9951016	RW TAP	<1.0			5/31/2003
13537	8J	WEBSTER	5/29/2003	5/30/2003	5/30/2003	DIANA SCHOOL	☑	NA	WV	0	MCCOY	9951005	RW TAP	<1.0			5/31/2003
12303	8J	WETZEL	4/28/2003	4/29/2003	4/29/2003	HUNDRED	☑	NA	WV	0	SMITH	3305202	PLANT	1.0		<1.0	4/30/2003
14265	8I	WETZEL	6/10/2003	6/11/2003	6/11/2003	PINE GROVE	☑	NA	WV	0	SMITH	3305205	RIVER CREEK	10		<10	6/12/2003
12539	8J	WOOD	5/6/2003	5/6/2003	5/6/2003	BELEVIEW INN	☑	ND	WV	0	SMITH	9954001	WELL HOUSE	<1.0		<1.0	5/7/2003

Cuts from Quality

STERIS®

FIELD SERVICE REPORT

TICKET NO. 1787275	DATE 8-16-02	ORG NO. 668	ACCOUNT NO. SERVICE TO: 8984245452
SERVICE TO: West Virginia Dept of Health			
ADDRESS 167 MLK Ave Hygienic LAB			
CITY S. Charleston	STATE WV	ZIP 25303	
CONTACT: DONNA SMITH	PHONE		
TYPE/MODEL: Reliance 570	LOCATION: CLASS Room A13		
SERIAL NO. 3667940100	METER: N/A		

ACCOUNT NO. BILL TO:	CUSTOMER P.O. NO.	PAGE 1 OF 1
CREDIT CARD #		EXP DATE: __/__ (m m / y y)
CARDHOLDER NAME:	PHONE NUMBER:	
BILL TO:		
ADDRESS		
CITY	STATE	ZIP
ATTENTION:		

ACTIVITY CODE ①: PM

INSTALLATION / PROJECT CODE ②:

INSTALLATION/PROJECT CODE DESCRIPTION:

TRAVEL

	CLOCK NO.	DATE	LINE CODE③	HOURS TECH	TEST INSTRUMENT	UNIT PRICE	EXTENDED AMOUNT
1					CONTROL #		
2							
3					CALIBRATION EXPIRATION DATE		
4					__/__/__		

LABOR

	CLOCK NO.	DATE	LINE CODE④	HOURS TECH	UNIT PRICE	EXTENDED AMOUNT
1	22110	8-16-02	LESA			
2						
3						
4						

PARTS

	CLOCK NO.	PART LINE CODE ⑤	PART NUMBER	DESCRIPTION	QTY	FAILURE CODE ⑥	UNIT PRICE	EXTENDED AMOUNT
1								
2								
3								
4								
5								
6								

COMMENTS: PM INSPECTION: DID NOT HAVE ticket.

MISC. TRAVEL EXPENSE (HOTEL, AIRLINE, CAR RENTAL, PARKING): OK 161 NAC

❑ TESTED OK

THIS DOES NOT INCLUDE APPLICABLE TAXES. TOTAL AMT:

CUSTOMER SIGNATURE/DATE: [illegible] on ticket 1750406

STERIS TECHNICIAN/DATE: [signature]

THIS IS NOT AN INVOICE. AUTHORIZING SIGNATURE INDICATES THE SERVICES LISTED ABOVE WERE PERFORMED.

CUSTOMER

Freedom_0006019_0115

ERIS®

INVOICE TO:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT # B984245452

EQUIPMENT LOCATED AT:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT #B984245452

AGREEMENT #	EXPIRE DATE	INSP DUE	CONTROL #	ASSET #	LOCATION
00009494/5	06-30-03	08-2002	108VLV		GLASS RM A13

SERIAL NUMBER: 0101381003
EQUIPMENT DESCRIPTION: STER GRAV 24X36X60EAGLE

TICKET # 1750469
COVERAGE: PM LABOR ONLY NORMAL
CC# _____
CC EXPIRE DATE _____

MAEM2001
AGREEMENT PURCHASE ORDER NUMBER
PART PURCHASE ORDER #
CONTACT _____
PHONE # _____

ASSIGNED TECH: 22977 PM TECH
SPECIAL INSTRUCTIONS

____MC ____VISA ____AMEXP

NON-PART ITEMS:

TECH CLOCK	WORK DATE (M M D D Y Y)	LINE CODE	QTY HOURS	LABOR RATE	EXTENDED AMOUNT	METER READING
22977	081602	LE5A				11549

PART ITEMS:

LINE CODE	WORK DATE (M M D D Y Y)	INV SOURCE	PART NUMBER	QTY	PRICE EACH	EXT AMOUNT
FAIL CODE:		PART DESCRIPTION:				
FAIL CODE:		PART DESCRIPTION:				
FAIL CODE:		PART DESCRIPTION:				
FAIL CODE:		PART DESCRIPTION:				
FAIL CODE:		PART DESCRIPTION:				
FAIL CODE:		PART DESCRIPTION:				

FS5212 V5.2.020607

TOTAL INVOICE AMOUNT _____
FOR PARTS TIME AND MATERIAL LABOR THIS PAGE ONLY.

CHANGES ON FORM ☐ (CHECK BOX)

CUSTOMER SIGNATURE Sign on page 2

TECHNICIAN SIGNATURE

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ERIS®

INVOICE TO:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT # B984245452

EQUIPMENT LOCATED AT:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT #B984245452

AGREEMENT #	EXPIRE DATE	INSP DUE	CONTROL #	ASSET #	LOCATION
00009494/5	06-30-03	08-2002	108VLT		

SERIAL NUMBER: 012759109
EQUIPMENT DESCRIPTION: 60" 3000 LAB/ISO

TICKET # 1750468
COVERAGE: PM
LABOR ONLY NORMAL

MAEM2001
AGREEMENT PURCHASE ORDER NUMBER

PART PURCHASE ORDER #

CC# _____
CC EXPIRE DATE _____
CONTACT _____
PHONE # _____

ASSIGNED TECH: 22977 PM TECH
SPECIAL INSTRUCTIONS

____MC ____VISA ____AMEXP

NON-PART ITEMS:

TECH CLOCK	WORK DATE	LINE CODE	QTY HOURS	LABOR RATE	EXTENDED AMOUNT	METER READING
22977	081602	LESA				6121
	M M D D Y Y					

PART ITEMS:

LINE CODE	WORK DATE	INV SOURCE	PART NUMBER	QTY	PRICE EACH	EXT AMOUNT
	M M D D Y Y	FAIL CODE:	PART DESCRIPTION:			
	M M D D Y Y	FAIL CODE:	PART DESCRIPTION:			
	M M D D Y Y	FAIL CODE:	PART DESCRIPTION:			
	M M D D Y Y	FAIL CODE:	PART DESCRIPTION:			
	M M D D Y Y	FAIL CODE:	PART DESCRIPTION:			
	M M D D Y Y	FAIL CODE:	PART DESCRIPTION:			

FS5212 V5.2.020607

TOTAL INVOICE AMOUNT _____
FOR PARTS TIME AND MATERIAL LABOR THIS PAGE ONLY.

CHANGES ON FORM ☐ (CHECK BOX)

CUSTOMER SIGNATURE Donna R Smith

TECHNICIAN SIGNATURE Kelly Hartley

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INVOICE TO:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT # B984245452

EQUIPMENT LOCATED AT:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT #B984245452

AGREEMENT #	EXPIRE DATE	INSP DUE	CONTROL #	ASSET #	LOCATION
00005690/7	06-30-03	08-2002			ANIMAL RM W/O

SERIAL NUMBER: 328973A
EQUIPMENT DESCRIPTION: MAN DOOR/IND GP CTRLS

TICKET # 1750407
COVERAGE: LABOR ONLY NORMAL
CC# _____
CC EXPIRE DATE _____
CONTACT _____
PHONE # _____

***PO REQUIRED
AGREEMENT PURCHASE ORDER NUMBER
PART PURCHASE ORDER #

ASSIGNED TECH: 22977 PM TECH
SPECIAL INSTRUCTIONS

_____MC _____VISA _____AMEXP

NON-PART ITEMS:

TECH CLOCK	WORK DATE (M M D D Y Y)	LINE CODE	QTY HOURS	LABOR RATE	EXTENDED AMOUNT	METER READING

PART ITEMS:

LINE CODE	WORK DATE (M M D D Y Y)	INV SOURCE	PART NUMBER	QTY	PRICE EACH	EXT AMOUNT
	FAIL CODE:		PART DESCRIPTION:			
	FAIL CODE:		PART DESCRIPTION:			
	FAIL CODE:		PART DESCRIPTION:			
	FAIL CODE:		PART DESCRIPTION:			
	FAIL CODE:		PART DESCRIPTION:			
	FAIL CODE:		PART DESCRIPTION:			

FS5212 V5.2.020607

TOTAL INVOICE AMOUNT _____
FOR PARTS TIME AND MATERIAL LABOR THIS PAGE ONLY.

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CUSTOMER SIGNATURE Jon Page 3 #1750406 TECHNICIAN SIGNATURE

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INVOICE TO:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT # B984245452

EQUIPMENT LOCATED AT:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT #B984245452

AGREEMENT #	EXPIRE DATE	INSP DUE	CONTROL #	ASSET #	LOCATION
00005690/7	06-30-03	08-2002			ANIMAL RM W/O

SERIAL NUMBER: 3289738
EQUIPMENT DESCRIPTION: HYDRAULIC DOOR LIFT

TICKET # 1750405
COVERAGE: LABOR ONLY NORMAL

***PO REQUIRED

AGREEMENT PURCHASE ORDER NUMBER

PART PURCHASE ORDER #

CC# _____
CC EXPIRE DATE _____
CONTACT _____
PHONE # _____

ASSIGNED TECH: 22977 PM TECH
SPECIAL INSTRUCTIONS

____MC ____VISA ____AMEXP

NON-PART ITEMS:

TECH CLOCK	WORK DATE (M M D D Y Y)	LINE CODE	QTY HOURS	LABOR RATE	EXTENDED AMOUNT	METER READING
22977	081602	LESA				NOIR

PART ITEMS:

LINE CODE	WORK DATE (M M D D Y Y)	INV SOURCE	PART NUMBER	QTY	PRICE EACH	EXT AMOUNT
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			

FS5212 V5.2.020607

TOTAL INVOICE AMOUNT _____
FOR PARTS TIME AND MATERIAL LABOR THIS PAGE ONLY.

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CUSTOMER SIGNATURE Signon Req 3# 1750405 TECHNICIAN SIGNATURE

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INVOICE TO:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT # 8984245452

EQUIPMENT LOCATED AT:
WEST VIRGINIA DEPARTMENT OF HEAL
167 11TH AVENUE HYGIENIC LAB
SOUTH CHARLESTON WV 25303
ACCOUNT #8984245452

AGREEMENT #	EXPIRE DATE	INSP DUE	CONTROL #	ASSET #	LOCATION
00005690/7	06-30-03	08-2002	108VLS		ANIMAL RM SB

SERIAL NUMBER: 328973
EQUIPMENT DESCRIPTION: IND STER 36X42X84AMSCO

TICKET # 1750406
COVERAGE: PM - MAJOR1 (764327168) CONFI
LABOR ONLY NORMAL

CC# _____

***PO REQUIRED

CC EXPIRE DATE _____

AGREEMENT PURCHASE ORDER NUMBER

PART PURCHASE ORDER #

CONTACT _____

PHONE # _____

ASSIGNED TECH: 22977 PM TECH

SPECIAL INSTRUCTIONS

____MC ____VISA ____AMEXP

NON-PART ITEMS:

TECH CLOCK	WORK DATE (M M D D Y Y)	LINE CODE	QTY HOURS	LABOR RATE	EXTENDED AMOUNT	METER READING
22977	081602	LESA				NONE

PART ITEMS:

LINE CODE	WORK DATE (M M D D Y Y)	INV SOURCE	PART NUMBER	QTY	PRICE EACH	EXT AMOUNT
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			
		FAIL CODE:	PART DESCRIPTION:			

FS5212 V5.2.020607

TOTAL INVOICE AMOUNT _____
FOR PARTS TIME AND MATERIAL LABOR THIS PAGE ONLY

CHANGES ON FORM ☐ (CHECK BOX)

CUSTOMER SIGNATURE Donna M Smith

TECHNICIAN SIGNATURE Kelly Hall

NOTICE - THIS IS NOT AN INVOICE

Purchase Order

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

PURCHASE ORDER NO.	PAGE
S030131	1

BLANKET RELEASE

CHANGE ORDER

CORRECT PURCHASE ORDER NUMBER MUST APPEAR ON ALL PACKAGES, INVOICES, AND SHIPPING PAPERS. QUESTIONS CONCERNING THIS PURCHASE ORDER SHOULD BE DIRECTED TO THE BUYER AS NOTED BELOW.

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

INVOICE TO:
HEALTH AND HUMAN RESOURCES
BPH - LABORATORY SERVICES
167 ELEVENTH AVENUE

SOUTH CHARLESTON, WV
25303

VENDOR:
*709014708 01 814-870-8469
STERIS CORPORATION
2424 WEST 23RD STREET

ERIE PA 16514

SHIP TO:
HEALTH AND HUMAN RESOURCES
BPH - LABORATORY SERVICES

167-ELEVENTH AVENUE
SOUTH CHARLESTON, WV
25303 304-558-3530

DATE PRINTED	TERMS OF SALE	FEIN/SSN	FUND
09/17/2002	NET 30	341482024	FIMS
SHIP VIA	**F.O.B.**	**FREIGHT TERMS**	**ACCOUNT NUMBER**
BEST WAY	DESTINATION	PREPAID	C --

LINE	QUANTITY / DELIVERY DATE	UOP / CAT. NO.	VENDOR ITEM NO. / ITEM NUMBER	UNIT PRICE	AMOUNT
	WV-88 AGENCY PURCHASE ORDER				
	MAINTENANCE AGREEMENT				
	EFFECTIVE: JULY 1, 2002 THROUGH JUNE 30, 2003				
0001	1	YR		.000000	.00
	09/30/2002		938-85		
	MAN DOOR/IND GP CTRLS SER# 328973A				
0002	1	YR		.000000	.00
	09/30/2002		938-85		
	HYDRAULIC DOOR LIFT SER#328973B				
0003	1	YR		4,167.480000	4,167.48
	09/30/2002		938-85		
	IND STER 36X42X84AMSCO SER# 328973				
0004	1	YR		3,192.000000	3,192.00
	09/30/2002		938-85		
	570 LAB GLASS WASH 25"HG' SER# 3609401005				

TOTAL: 7,359.48

IF APPROVAL AS TO FORM IS REQUIRED BY ATTORNEY GENERAL, CHECK HERE ☐

Director, Office of Purchasing
304-558-0953

BUYER: 304-558-1294

APPROVED AS TO FORM BY ASSISTANT ATTORNEY GENERAL

BY PURCHASING DIVISION AUTHORIZED SIGNATURE

Purchase Order

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

PURCHASE ORDER NO.	PAGE
S030131	2

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25303 304-558-3530

DATE PRINTED	TERMS OF SALE	FEIN/SSN	FUND
09/17/2002	NET 30	341482024	FIMS
SHIP VIA	**F.O.B.**	**FREIGHT TERMS**	**ACCOUNT NUMBER**
BEST WAY	DESTINATION	PREPAID	C --

LINE	QUANTITY / DELIVERY DATE	UOP / CAT. NO.	VENDOR ITEM NO. / ITEM NUMBER	UNIT PRICE	AMOUNT
	TO BE BILLED FOR SERVICES BI-MONTHLY AS FOLLOWS:				
	JULY & AUGUST 2002 = SEPTEMBER 1, 2002				
	SEPTEMBER & OCTOBER 2002 = NOVEMBER 1, 2002				
	NOVEMBER & DECEMBER 2002 = JANUARY 1, 2003				
	JANUARY & FEBRUARY 2003 = MARCH 1, 2003				
	MARCH & APRIL 2003 = MAY 1, 2003				
	MAY & JUNE 2003 = JULY 1, 2003				
	BI-MONTHLY PAYMENT TO BE $1,226.58 (WILL BE PAID BY P-CARD)				

IF APPROVAL AS TO FORM IS REQUIRED BY ATTORNEY GENERAL, CHECK HERE ☐

TOTAL

APPROVED AS TO FORM BY ASSISTANT ATTORNEY GENERAL

BY _____
PURCHASING DIVISION AUTHORIZED SIGNATURE

Purchase Order

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

PURCHASE ORDER NO: S030131

PAGE:

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25303

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*709014708 01 814-870-8469
STERIS CORPORATION
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167-ELEVENTH AVENUE
SOUTH CHARLESTON, WV
25303 304-558-3530

DATE PRINTED	TERMS OF SALE	FEIN/SSN	FUND
09/17/2002	NET 30	341482024	FIMS
SHIP VIA	**F.O.B**	**FREIGHT TERMS**	**ACCOUNT NUMBER**
BEST WAY	DESTINATION	PREPAID	C --

LINE	QUANTITY / DELIVERY DATE	UOP / CAT. NO.	VENDOR ITEM NO. / ITEM NUMBER	UNIT PRICE	AMOUNT

RECEIPT TICKET FOR PURCHASE ORDER: S030131

LINE	CATNO	ITEM NUMBER	DESCRIPTION	QTY	DATE
0001	938-85		MAN DOOR/IND GP CTRLS SER# 328973A	_____	_____
0002	938-85		HYDRAULIC DOOR LIFT SER#328973B	_____	_____
0003	938-85		IND STER 36X42X84AMSCO SER# 328973	_____	_____
0004	938-85		570 LAB GLASS WASH 25"HG' SER# 360	_____	_____

SIGNATURE _____ DATE _____

IF APPROVAL AS TO FORM IS REQUIRED BY ATTORNEY GENERAL, CHECK HERE ☐

TOTAL

_____
APPROVED AS TO FORM BY ASSISTANT ATTORNEY GENERAL

BY _____
PURCHASING DIVISION AUTHORIZED SIGNATURE

STERIS®

41201 / 22977

PREVENTIVE MAINTENANCE AGREEMENT RENEWAL- LABOR ONLY NORMAL HOURS

DATE PRINTED: 09/13/02

AGREEMENT#: 00005690 /7

INVOICE TO: B984245452
West Virginia Department of Health
ATTN:
167 11th Avenue Hygienic Lab
South Charleston WV 25303

EQUIPMENT LOCATION: B984245452
West Virginia Department of Health
167 11th Avenue Hygienic Lab
South Charleston WV 25303

DSM: DSM WOODRUFF #08208
TECH: HARTLEBEN KELLY

ORG: 41201
CLOCK#: 22977
PARTS PO#:

CONTRACT TERM: 07/01/02 -06/30/03 CUSTOMER PURCHASE ORDER#: ***PO REQUIRED

IN ADDITION TO THE STANDARD TERMS AND CONDITIONS ON THE REVERSE SIDE OF THIS DOCUMENT,THE FOLLOWING COVERAGE OPTIONS APPLY TO THE EQUIPMENT ON THE ATTACHED PAGE(S)

***CALLBACK SERVICE IS INCLUDED IN THIS CONTRACT FOR THE ENTIRE TIME PERIOD BETWEEN INSPECTIONS DURING NORMAL WORKING HOURS, MONDAY - FRIDAY, 8:00AM TO 5:00PM LOCAL TIME, CORPORATE HOLIDAYS EXCLUDED.

BILLING FREQUENCY: Every 2 Months

PLEASE RETURN THE CUSTOMER ACCEPTANCE COPY OF THE EQUIPMENT LISTING TO THE ATTENTION OF YOUR CONTRACT ADMINISTRATOR AT:

STERIS CORPORATION
2424 W 23RD ST
ERIE PA 16506
ATTN: SERVICE CONTRACT ADMINISTRATION DEPARTMENT
PHONE#: 1-800-333-8828 WITH CONTRACT QUESTIONS
FAX#: 1-814-870-8841

RECEIVED
2002 SEP 16 PM 12:40
OFIC. OF DHHR PURCHASING

RECEIVED
SEP 16 2002
OFFICE OF LABORATORY SERVICES
FISCAL OFFICE

CUSTOMER ACCEPTANCE Deputy Director 9/12/02

Director, Office of DHHR Purchasing
304-558-0953

STERIS CORPORATION 9-13-02

FS5211 V5.0.011011 PAGE 1 OF 2

*** THIS IS NOT AN INVOICE
INVOICE TO FOLLOW***

CUSTOMER

STERIS®

41201 / 22977

PREVENTIVE MAINTENANCE AGREEMENT RENEWAL- LABOR ONLY NORMAL HOURS

DATE PRINTED: 09/13/02

AGREEMENT#: 00005690 /7

INVOICE TO: B984245452
West Virginia Department of Health
ATTN:
167 11th Avenue Hygienic Lab
South Charleston WV 25303

EQUIPMENT LOCATION: B984245452
West Virginia Department of Health
167 11th Avenue Hygienic Lab
South Charleston WV 25303

DSM: DSM WOODRUFF #08208
TECH: HARTLEBEN KELLY

ORG: 41201
CLOCK#: 22977
PARTS PO#:

CONTRACT TERM: 07/01/02 -06/30/03

CUSTOMER PURCHASE ORDER#: ***PO REQUIRED

DESCRIPTION/ INSPECTION SCHEDULE	SERIAL#	LOCATION/ CONTR.TYPE	ANNUAL BILL PRICE	BILLING PRICE
MAN DOOR/IND GP CTRLS BIMONTHLY IN AUG,OCT,DEC,FEB,APR&JUN	328973A	ANIMAL RM	$0.00	$0.00
HYDRAULIC DOOR LIFT BIMONTHLY IN AUG,OCT,DEC,FEB,APR&JUN	328973B	ANIMAL RM	$0.00	$0.00
IND STER 36X42X84AMSCO BIMONTHLY IN AUG,OCT,DEC,FEB,APR,JUN	328973	ANIMAL RM S	$4,167.48	$694.58
570 LAB GLASS WASH 25"HG BIMONTHLY IN AUG,OCT,DEC,FEB,APR,JUN	3609401005		$3,192.00	$532.00

SITE/TECH SUB TOTAL: $1,226.58

BILLING PRICE TOTAL: $1,226.58

NO OF ITEMS TO BE INSPECTED: 4
BILLING FREQUENCY: Every 2 Months

BILLING VALUE: $1,226.58
ANNUAL CONTRACT VALUE: $7,359.48
TOTAL CONTRACT VALUE: $7,359.48

RECEIVED

SEP 16 2002

OFFICE OF LABORATORY SERVICES
FISCAL OFFICE

CUSTOMER ACCEPTANCE _____ / /

STERIS CORPORATION _____ 9-13-02

FS5211 V5.0.011011

*** THIS IS NOT AN INVOICE
INVOICE TO FOLLOW***

CUSTOMER

WV-96
Rev. 5/94

AGREEMENT ADDENDUM

In the event of conflict between this addendum and the agreement, this addendum shall control:

1. ARBITRATION - Any references to arbitration contained in the agreement are hereby deleted. Disputes arising out of the agreement shall be presented to the West Virginia Court of Claims.

2. HOLD HARMLESS - Any clause requiring the Agency to indemnify or hold harmless any party is hereby deleted in its entirety.

3. GOVERNING LAW - The agreement shall be governed by the laws of the State of West Virginia. This provision replaces any references to any other State's governing law.

4. TAXES - Provisions in the agreement requiring the Agency to pay taxes are deleted. As a State entity, the Agency is exempt from Federal, State, and local taxes and will not pay taxes for any Vendor including individuals, nor will the Agency file any tax returns or reports on behalf of Vendor or any other party.

5. PAYMENT - Any references to prepayment are deleted. Payment will be in arrears.

6. INTEREST - Should the agreement include a provision for interest on late payments, the Agency agrees to pay the maximum legal rate under West Virginia law. All other references to interest or late charges are deleted.

7. RECOUPMENT - Any language in the agreement waiving the Agency's right to set-off, counterclaim, recoupment, or other defense is hereby deleted.

8. FISCAL YEAR FUNDING - Service performed under the agreement may be continued in succeeding fiscal years for the term of the agreement, contingent upon funds being appropriated by the Legislature or otherwise being available for this service. In the event funds are not appropriated or otherwise available for this service, the agreement shall terminate without penalty on June 30. After that date, the agreement becomes of no effect and is null and void. However, the Agency agrees to use its best efforts to have the amounts contemplated under the agreement included in its budget. Non-appropriation or non-funding shall not be considered an event of default.

9. STATUTE OF LIMITATION - Any clauses limiting the time in which the Agency may bring suit against the Vendor, lessor, individual, or any other party are deleted.

10. SIMILAR SERVICES - Any provisions limiting the Agency's right to obtain similar services or equipment in the event of default or non-funding during the term of the agreement are hereby deleted.

11. ATTORNEY FEES - The Agency recognizes an obligation to pay attorney's fees or costs only when assessed by a court of competent jurisdiction. Any other provision is invalid and considered null and void.

12. ASSIGNMENT - Notwithstanding any clause to the contrary, the Agency reserves the right to assign the agreement to another State of West Virginia agency, board or commission upon thirty (30) days written notice to the Vendor and Vendor shall obtain the written consent of Agency prior to assigning the agreement.

13. LIMITATION OF LIABILITY - The Agency, as a State entity, cannot agree to assume the potential liability of a Vendor. Accordingly, any provision limiting the Vendor's liability for direct damages or limiting the Vendor's liability under a warranty to a certain dollar amount or to the amount of the agreement is hereby deleted. In addition, any limitation is null and void to the extent that it precludes any action for injury to persons or for damages to personal property.

14. RIGHT TO TERMINATE - Agency shall have the right to terminate the agreement upon thirty (30) days written notice to Vendor.

15. TERMINATION CHARGES - Any provision requiring the Agency to pay a fixed amount or liquidated damages upon termination of the agreement is hereby deleted. The Agency may only agree to reimburse a Vendor for actual costs incurred or losses sustained during the current fiscal year due to wrongful termination by the Agency prior to the end of any current agreement term.

16. RENEWAL - Any reference to automatic renewal is hereby deleted. The agreement may be renewed only upon mutual written agreement of the parties.

17. INSURANCE - Any provision requiring the Agency to insure equipment or property of any kind and name the Vendor as beneficiary or as an additional insured is hereby deleted.

18. RIGHT TO NOTICE - Any provision for repossession of equipment without notice is hereby deleted. However, the Agency does recognize a right of repossession with notice.

19. ACCELERATION - Any reference to acceleration of payments in the event of default or non-funding is hereby deleted.

20. AMENDMENTS - All amendments, modifications, alterations or changes to the agreement shall be in writing and signed by both parties. No amendment, modification, alteration or change may be made to this addendum without the express written approval of the Purchasing Division and the Attorney General.

ACCEPTED BY:

STATE OF WEST VIRGINIA

Spending Unit: DHHR

Signed: Dennis Rayburn

Title: Director, Office of DHHR Purchasing
304-558-0953

Date: September 27 2002

VENDOR

Company Name: STERIS Corporation

Signed: [signature]

Title: MANAGER

Date: 9-13-02

RFQ No. _____

AFFIDAVIT

West Virginia Code §5A-3-10a states:

No contract or renewal of any contract may be awarded under this article to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor as defined in this section and the debt owed is an amount greater than five thousand dollars in the aggregate.

Definitions:

"Debt" means any assessment, penalty, fine, tax or other amount of money owed to the state because of a judgement, fine, permit violation, license assessment, penalty or other assessment presently due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon;

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions;

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor, so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

Exception:

The prohibition does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the West Virginia Code, worker's compensation premium, permit fee or environmental fee or assessment, and the matter has not become final, or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (West Virginia Code §61-5-3), it is hereby certified that the bidder and all related parties do not owe any debts or, if a debt is owed, that the provisions of the exception clause (above) apply.

Vendor's Name: STERIS Corporation

Authorized Signature: _____ Date: 9-13-02

No Debt Affidavit
July 20, 2001

Labs QM
INTernal &
Cal cert
~~8/5/99~~
5/17/00

STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES

Cecil H. Underwood
Governor

Joan E. Ohl
Secretary

ENVIRONMENTAL MICROBIOLOGY

Mission Statement

The Environmental Microbiology Section of the Office of Laboratory Services is responsible for the microbiological examination of drinking water under the Safe Drinking Water Act (SDWA) and the Total Coliform Rule (TCR). In addition to drinking water samples from both community and non-community water supplies, the section also receives water samples from private individuals, recreational waters (swimming pools, bathing beaches and hot tubs), bottled water companies, dairy plants and farms.

The Environmental Microbiology Section is the only Certified Grade A Milk Laboratory in the state of West Virginia. The section is responsible for analyzing Grade A Milk and Milk Products and governed by the Pasteurized Milk Ordinance (PMO), National Conference on Interstate Milk Shipments (NCIMS) and the Food and Drug Administration (FDA). In addition to examining pasteurized milk and milk products produced in West Virginia and raw milk (from producers), the section also analyzes all of the milk that is shipped into West Virginia from other states.

The third responsibility of the Environmental Microbiology Section is the Certification Program for Drinking Water Laboratories and Grade A Milk Laboratories. Laboratory Certification Officers (LCO) within the section are responsible for performing tri-annual evaluations of Drinking Water Laboratories and granting Certification for the Microbiological Analysis of Drinking Water. The Laboratory Evaluation Officer (LEO) is responsible for performing tri-annual evaluations of Milk Laboratories and granting certification to the facilities and analysts. Currently, there are no other certified milk laboratories in West Virginia.

It is the goal of the Environmental Microbiology Section to provide precise and accurate test analysis and services to its customers and clients within reasonable turn-around-times. By following the guidelines and procedures set forth in this manual and referencing the following publications: *EPA's Manual for the Certification of Laboratories Analyzing Drinking Water*, *Standard Methods for the Examination of Water and Waste Water*, *EPA's Microbiological Methods for Monitoring the Environment*, FDA 2400 Series Forms, *Standard Methods for the Examination of Dairy Products*, *Pasteurized Milk Ordinance* (PMO), Federal Registers, *Legislative Rule - Division of Health - Public Water Systems* (64 CSR 3), *West Virginia Administrative Rules - Department of Health and Human Resources - Water Facilities* (64 CSR 16), the section can help ensure the health and welfare of the citizens of West Virginia.

Thomas L. Ong, Microbiologist Supervisor
Environmental Microbiology
Laboratory Certification Officer
Laboratory Evaluation Officer

BUREAU FOR PUBLIC HEALTH
OFFICE OF LABORATORY SERVICES
167 11th Avenue
South Charleston, West Virginia 25303-1137

Phone: (304) 558-3530

FAX: (304) 558-2006

I. Chain of Command

West Virginia Department of Health and Human Resources
Bureau For Public Health
Office of Laboratory Services

Andrea Labik, Sc.D.
Director
Office of Laboratory Services

VACANT
Associate Director,
Environmental Microbiology
Environmental Chemistry
Newborn Screening

Environmental Microbiology

Thomas L. Ong
Microbiologist Supervisor
Laboratory Certification Officer (EPA)
Laboratory Evaluation Officer (FDA)
FDA#17-24

Joyce Vance-Abshire
Microbiologist III
Laboratory Certification Officer (EPA)
FDA#17-33

Mike Flesher
Microbiologist II
FDA#17-32

Tracy Bossie
Microbiologist I
FDA#17-

William "Joe" Cochran
Laboratory Assistant II
FDA#17-

Micah Moore
Laboratory Assistant II
FDA#17-

II. Position Requirements For Environmental Microbiology

Position	Training	Experience	Substitution
Microbiologist Supervisor	Graduation from an accredited four-year college or university with a minimum of twenty-five (25) semester hours in physical science courses including a course in microbiology and eight (8) semester hours in chemistry. - or - A bachelor's degree from an accredited four-year college or university with a minimum of fifteen (15) semester hours in microbiology.	Four years of full-time or equivalent part-time paid experience as a microbiologist.	Graduate training in microbiology may be substituted for the required experience on a year-for-year basis for a maximum of two years.
Microbiologist III	Graduation from an accredited four-year college or university with a minimum of twenty-five (25) semester hours in physical science courses including a course in microbiology and eight (8) semester hours in chemistry. - or - A bachelor's degree from an accredited four-year college or university with a minimum of fifteen (15) semester hours in microbiology.	Three years of full-time or equivalent part-time paid experience as a microbiologist.	Graduate training in microbiology may be substituted for the required experience on a year-for-year basis for a maximum of two years.
Microbiologist II	Graduation from an accredited four-year college or university with a minimum of twenty-five (25) semester hours in physical science courses including a course in microbiology and eight (8) semester hours in chemistry. - or - A bachelor's degree from an accredited four-year college or university with a minimum of fifteen (15) semester hours in microbiology.	One year of full-time or equivalent part-time paid experience as a microbiologist.	Graduate training in microbiology may be substituted for the required experience on a year-for-year basis.
Microbiologist I	Graduation from an accredited four-year college or university with a minimum of twenty-five (25) semester hours in physical science courses including a course in microbiology and eight (8) semester hours in chemistry. - or - A bachelor's degree from an accredited four-year college or university with a minimum of fifteen (15) semester hours in microbiology.		

Position	Education	Experience	Substitution
Laboratory Assistant II	Graduation from a standard high school or the equivalent.	Two years of full-time or equivalent part-time paid experience in medical or other laboratory work.	Successfully completed study in accredited college or university which included at least ten semester hours in physical or biological sciences or an associate degree in a laboratory science or medical technology. Completion of a recognized laboratory assistant course from a vocational school may be substituted on a year-for-year basis for the required experience.

III. Position Responsibilities

Position	Description of Duties
Microbiologist Supervisor	**I.** Obey all rules, regulations, policies and procedures established by state, federal and related agencies. **II.** Provide technical and administrative supervision to the Environmental Microbiology Section as follows: **A.** Provide day-to-day supervision and coordination of all test activities and monitor test analysis to see that acceptable levels of analytical performances are maintained; **B.** Plan, develop and implement all guidelines and regulations for the microbiological testing of drinking water and grade A milk and milk products; **C.** Collaborate with state and federal regulatory personnel to coordinate and incorporate regulations into the testing program; **D.** Serve as the lead certification officer for the microbiological testing of drinking water (EPA) and of grade A milk and milk products (FDA); **E.** Coordinate and direct all activities related to the certification of public and private laboratories for testing drinking water and milk products including on-site inspections; **F.** Plan, supervise and direct proficiency testing program activities for public and private laboratories; **G.** Supervise the preparation of updated procedure manuals and daily documentation of quality control and quality assurance activities; **H.** Approve staff and workload schedule assignments; **I.** Provide technical training and consultation to all section personnel and, where appropriate, to public and private laboratories; **J.** Direct and assist with all technical troubleshooting and problem-solving activities; **K.** Evaluate competency of all testing personnel and ensure that staff maintain competency to perform tests and report test results accurately and promptly; **L.** Maintain required documentation of Section activities and prepare reports as required; **M.** Maintain documentation of personnel activities and make recommendations concerning personnel action; **N.** Serve as the spokesperson for the Section providing expert consultation, when necessary; **O.** Coordinate section work activities with the Media-Glassware Section and provide information to ensure that all media and glassware preparations meet federal and state requirements; **P.** Provide consultation and oversight of the laboratory distilled water systems; **Q.** Assist in the interviewing and evaluation of candidates to be recommended for employment; **R.** Orient and train new employees; **S.** Prepare and conduct continuing education for all section personnel; **T.** Perform and document employee evaluations; **U.** Provide technical consultation and support to District environmental Laboratory. **III.** Perform technical duties as required.

Position	Description of Duties
Microbiologist III Assistant Supervisor	**I.** Obey all rules, regulations, policies and procedures established by State, Federal and related agencies. **II.** Under the direction of the supervisor, Environmental Microbiology Section, the employee is responsible for administrative and supervisory duties as follows: **A.** Coordinate Section Activities in the supervisor's absence and assist with the supervisory duties as directed; **B.** Coordinate and monitor the flow of specimen processing; **C.** Read interpret EPA and FDA guidelines and develop an up-to-date procedure manual; **D.** Attend staff meetings with the environmental engineering division. Prepare and deliver oral and written presentations for these meetings; **E.** Coordinate the maintenance and documentation of quality assurance, preventative maintenance and laboratory safety records; **F.** Communicate information from FDA and EPA to engineers, county sanitarians, water plant operators, dairy industries, private labs, and private citizens; **G.** Assist with the coordination and scheduling of leave requests for the employees of the Section. **III.** Under the direction of the Supervisor, Environmental Microbiology Section, employee is responsible for duties relating to the normal operation of the section, specimen testing, reporting, etc. as follows: **A.** Perform routine microbiological testing and quality control for drinking water and milk as specified by EPA and FDA using standard and applicable methodology; **B.** Comprehend and master skill in microcomputer applications in word processing, spreadsheet development, graphics and database programming. Attend training coursed pertaining to various software packages that are utilized; **C.** Anticipate and maintain the necessary supplies and equipment required for the operation of the section; **D.** Respond to inquiries related to water and milk microbiology from the public, state sanitarians and other program officials; **E.** Meet and maintain eligibility requirements for certification for the EPA and FDA. **IV.** Participate in training and performance evaluations, maintain status as a Laboratory Certification/Evaluation Officer as follows: **A.** Perform water and milk laboratory on-site evaluations as required by EPA and FDA. Extensive travel is required; **B.** Prepare evaluation narrative and survey form for official on-site laboratory review; **C.** Conduct reviews and consultations in circumstances when an analyst is unable to meet the required standards established by federal agencies. Includes on-site observances; **D.** Consultant to certified laboratories; **E.** Plan, prepare, distribute, and perform and evaluate proficiency testing samples for state and federal programs; **F.** Participate satisfactorily in federal proficiency testing and performance evaluations in order to maintain certification officer status. **V.** The employee is required to actively participate in training activities as follows: **A.** Atoned and participate in state program meetings, workshops and training seminar for the purpose of conveying information to Section personnel; **B.** Assist with hands-on bench training and workshops for analysts, water plant operators, county sanitarians and others connected with the water and milk programs, to include testing with interpretation of results, proper procedures in submission of specimen samples, completion of history forms and the review and explanation of all pertinent testing information; **C.** Prepare written correspondence to be periodically sent to laboratory personnel regarding updates in procedures, etc. **VI.** Other duties as required and/or assigned.
Microbiologist II	**I.** Obey all rules, regulations, policies and procedures established by State, Federal and related agencies. **II.** Provides sample examinations of milk, dairy products and drinking water using documented federal and state guidelines and procedures for such testing as follows: **A.** Examines (daily, weekends and holidays) samples of milk and/or water using approved technical procedures as specified and fulfills the requirements for certification (FDA and/or EPA) for sample examination; **B.** Assists in all phases of specimen accession and documentation. Reject samples not meeting established criteria; **C.** Performs reading, interpreting, and completing of test analysis using knowledge of microbial reactions. Laboratory results are entered on worksheets and history forms and when necessary incumbent insures positive reports positive lab results to regulatory agencies and related organizations. Consults with supervisor on unusual test results or problems; **D.** Performs maintenance of laboratory equipment. Documents quality assurance, quality control and preventive maintenance activities as part of assigned duties. Follows safety requirements; **E.** Assists in preparing and up-dating procedures manual which reflects specimen testing, reporting, training and proficiency sample preparation; **F.** Under moderate supervision by the supervisor, handles inquiries, requests and problems from clients; **G.** Conducts inventory and prepares orders for media, supplies and equipment and submits these orders to the supervisor; **H.** Prepares and mails milk shipping cases to program users as scheduled; **I.** Receives and performs all activities related to the acceptance and accession of milk samples using established criteria; **J.** Participate satisfactorily in federal proficiency testing and performance evaluations in order to maintain certification. **III.** May participate in training to qualify for certification as a Laboratory Certification/Evaluation Officer for drinking water and/or milk as follows: **A.** Successfully complete federal training courses; **B.** Satisfactorily participate in joint surveys with supervisor and/or federal certification/evaluation officer; **C.** Submit a satisfactory survey report to the supervisor and/or appropriate federal agency. **IV.** Completes in a timely manner special projects assigned by the supervisor. **V.** Performs other duties as assigned.

Position	Description of Duties
Microbiologist I	**I.** Obey all rules, regulations, policies and procedures established by State, Federal and related agencies. **II.** Is in training for a minimum of one year to provide sample examinations of milk, dairy products and drinking water using documented federal and state guidelines and procedures for such testing as follows: **A.** Examines (daily, weekends and holidays) samples of milk and/or water using approved technical procedures as specified and fulfills the requirements for certification (FDA and/or EPA) for sample examination; **B.** Assists in all phases of specimen accession and documentation. Reject samples not meeting established criteria; **C.** Performs reading, interpreting, and completing of test analysis using knowledge of microbial reactions. Laboratory results are entered on worksheets and history forms and when necessary incumbent insures positive reports positive lab results to regulatory agencies and related organizations. Consults with supervisor on unusual test results or problems; **D.** Performs maintenance of laboratory equipment. Documents quality assurance, quality control and preventive maintenance activities as part of assigned duties. Follows safety requirements; **E.** Assists in preparing and up-dating procedures manual which reflects specimen testing, reporting, training and proficiency sample preparation; **F.** Under moderate supervision by the supervisor, handles inquiries, requests and problems from clients; **G.** Conducts inventory and prepares orders for media, supplies and equipment and submits these orders to the supervisor; **H.** Prepares and mails milk shipping cases to program users as scheduled; **I.** Receives and performs all activities related to the acceptance and accession of milk samples using established criteria.
Laboratory Assistant II	**I.** Obey all rules, regulations, policies and procedures established by State, Federal and related agencies. **II.** Participate satisfactorily in federal and state proficiency testing program. **III.** Refer inquiries, requests and/or problems to supervisor, as necessary. **IV.** Maintain a safe and orderly work area. **V.** Examines (daily, weekends and holidays) water samples and provides assistance in the routine examination of milk (Standard Plate and Coliform Count, Lactek - BL and CEF). Participates in quality control, laboratory safety and preventive maintenance programs and laboratory safety programs, as described in the procedure manuals, and detailed below: **A.** Assist in testing laboratory water quality; **B.** Assist in documentation of in-house quality control data/data entry for monthly/semi annual and annual report; **C.** Work on special projects when needed; **D.** Assist in opening, sorting, date stamping, logging in, preparation of samples and clean up; **E.** Assist in reading, interpreting and computing testing results, entering on worksheet and history form, and seeing that positive results are faxed to the appropriate regulatory agencies and related companies; **F.** Assist in ordering media, supplies and equipment for proper operation of section; **G.** Mail out and receive milk shipping cases; **H.** Assists in preparing and up-dating procedures manual which reflects specimen testing, reporting, training and proficiency sample preparation; **I.** Other duties as necessary.

IV. Personnel Performance

New Employees -

All new employees start with a six month "Probationary Status". New employees receive the "New Employee Handbook" along with all the pertinent survey forms and check lists (EPA's Manual for the Certification of Laboratories Analyzing Drinking Water - Chapters I, II, III, V and Appendices and the FDA 2400 Series Forms). Also, each new employee receives one-on-one hands on training with a Microbiologist II or higher. After three months of employment, each employee is given a written "Job Knowledge Questionnaire" to identify areas to concentrate on. The same questionnaire is given again after five months of employment to evaluate improvement. At the five month point, a new employee receives a formal evaluation as detailed below. A minimum score of "3" must be obtained in order to be recommended for "Permanent Status"

New and Permanent Employees -

Each employee (Ratee) is evaluated on an annual basis by their immediate supervisor (Rater). The employee is rated on Dependability, Quality, Judgement, Initiative, Communication and Use of Time. Those employees with supervisory duties will be rated on those four categories plus Supervision/Management Ability.

The rating period runs from January 1 through December 31 of any given year. Within the first 30 days of the rating period, a primary counseling session is set up with each employee. The purpose of the primary counseling session is as follows:

1. Define the organizational mission.
2. Discuss individual job expectations and performance.
3. Reinforce good performance/work-related behavior.
4. Discuss any areas that need improvement.
5. Enhance the Ratee's ability to set and reach career goals.

Six months after the primary counseling session, another counseling session is set up with the employee. The purpose of this is as follows:

1. Discuss job requirements and areas of special emphasis and priorities that have changed or are new.
2. Discuss how the Ratee is doing.
3. Discuss the Ratee's career goals, the effectiveness of training, and the Ratee's potential to perform higher level or different tasks.

At the end of the rating period, a checklist (See Attachment 1) is used to numerically rate the Ratee with the following scores:

5 = Excellent
4 = Very Good
3 = Satisfactory
2 = Fair
1 = Unsatisfactory

If a Ratee receives an overall score of 1 or 2, then the supervisor (Rater) will develop a specific plan of improvement with that individual.

V. Technical Performance

Water Laboratory -

The water laboratory falls under the jurisdiction of the U.S. E.P.A. and is currently fully certified to perform drinking water analysis for total coliform bacteria and fecal coliform/E. coli by Membrane Filtration, Multi Tube Fermentation and ONPG-MUG. In order to maintain certification, the laboratory must participate in proficiency testing once a year and an on-site evaluation once every three years. Even though the laboratory submits one set of data for proficiency tests, all analysts are required to participate. During the on-site evaluation, different analysts will be asked to demonstrate various tests.

In order to maintain full certification, the laboratory must:

1. Correctly identify at least 80% of the proficiency test samples.
2. Must use methods specified in the drinking water regulations 40 CFR part 141. Methods are also listed in Chapter V of the EPA's Manual for the Certification of Laboratories Analyzing Drinking Water.
3. Keep the Certifying Authority (CA) notified of major changes (personnel, equipment and laboratory location).
5. Must successfully pass an on-site evaluation.

The laboratory's certification status can be downgraded from Fully Certified to Provisionally Certified for any one of the following methods:

1. Failure to analyze a Proficiency Sample within the established acceptance limits.
2. Failure to notify the CA within 30 days of major changes.
3. Failure to maintain the standard of quality based upon an on-site evaluation.
4. Failure to report compliance data to the public water system or the Office of Environmental Health Services - Engineering Division in a timely manner.

The laboratories certification status will be downgraded form Fully Certified or Provisionally Certified to Not Certified for any one of the following reasons:

1. Submission of a Proficiency Sample to another laboratory for analysis and reporting data as its own.
2. Falsification of data or other deceptive practices.
3. Failure to correctly analyze a proficiency samples for the second consecutive time.
4. If provisionally certified, failure to correct the deviations cited on an on-site evaluation.
5. If provisionally certified, failure to report compliance data to the public water system or the Office of Environmental Health Services - Engineering Division in a timely manner.

Milk Laboratory -

The milk laboratory fall under the jurisdiction of the Food and Drug Administration - Laboratory Quality Assurance Branch. Each analyst that examines milk samples in the IMS program must be individually certified by the FDA. The certification applies to the laboratory as a whole as well as each test method. The Environmental Microbiology currently has analysts certified for the following tests:

Test	Number of Analysts Certified in Each Position Classification				
	Microbiologist Supervisor	Microbiologist III	Microbiologist II	Microbiologist I	[illegible]
Standard Plate Count	1[1]	1[1]	1[1]	1[2]	1[2]
Coliform Count	1[1]	1[1]	1[1]	1[2]	1[2]
Charm BSDA	1[1]	1[1]	1[1]	1[2]	1[2]
Lactek BL	1[1]	1[1]	1[1]	1[2]	1[2]
Lactek CEF	1[1]	1[1]	1[1]	1[2]	1[2]
DMSCC	1[1]	1[1]	1[1]		
Delvo P 5 Pack	1[1]	1[1]	1[1]	1[2]	2[2]
ESCC	1[1]	1[1]	1[1]		
Phosphatase - Scharer Rapid	1[1]	1[1]	1[1]		
Phosphatase - Fluorometer	1[1]	1[1]	1[1]		
Pasteurized Milk Containers	1[1]	1[1]	1[1]	1[2]	1[2]

[1] "Fully Certified"
[2] "Conditionally Certified"

Analysts that are "Fully Certified", "Provisionally Certified" and "Conditionally Certified" are allowed to examine milk samples that are for the IMS, Raw Milk Programs. Analysts that are "Not Certified" may be allowed to participate in the examination of milk samples from the County (State) Program by approval from the Section Supervisor.

The following chart indicates how the different levels of certification are obtained and

what happens when there is unsatisfactory performance on proficiency tests or on-site evaluations:

Chart For Determining Certification Status

Current Status	Proficiency Test	On-Site Evaluation	Results	Comments
New Analyst	Satisfactory		Conditional Certification	
New Analyst		Satisfactory	Conditional Certification	
New Analyst	Satisfactory	Satisfactory	Full Certification	
New Analyst	Unsatisfactory		Not Certified	Cannot obtain "Conditional Certification" until satisfactory performance on next proficiency test.
New Analyst		Unsatisfactory	Not Certified	Cannot obtain "Conditional Certification" until satisfactory performance on next On-site Evaluation.
Conditional Certification	Unsatisfactory		Not Certified	Cannot obtain "Conditional Certification" until satisfactory performance on next proficiency test.
Conditional Certification		Unsatisfactory	Not Certified	Cannot obtain "Conditional Certification" until satisfactory performance on next On-site Evaluation.
Full Certification	Unsatisfactory		Provisional Certification	Cannot obtain "Full Certification" until satisfactory performance on next proficiency test.
Full Certification		Unsatisfactory	Provisional Certification	Cannot obtain "Full Certification" until satisfactory performance on next On-site Evaluation.
Provisional Certification	Unsatisfactory		Not Certified	Cannot obtain "Conditional Certification" until satisfactory performance on next On-site Evaluation.
Provisional Certification		Unsatisfactory	Not Certified	Cannot obtain "Conditional Certification" until satisfactory performance on next On-site Evaluation.
Provisional Certification (due to unsatisfactory performance on proficiency test)	Satisfactory		Full Certification	

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Provisional Certification (due to unsatisfactory performance on on-site evaluation)		Satisfactory	Full Certification	

VI. Laboratory Certification/Evaluation Officer (EPA/FDA) -

Laboratory Certification Officer (EPA) -

This position is available only for Microbiologist II Classification or higher. It involves performing on-site evaluations of certified laboratories and those wishing to become certified for the microbiological analysis of drinking water. The following are requirements for becoming a Laboratory Certification Officer:

1. Microbiologist II Classification or higher
2. Successfully complete the EPA's Drinking Water Laboratory Certification Officers Course.
3. Participate in several on-site evaluations with the Head Certification Officer.

Laboratory Evaluation Officer (FDA) -

This position is available only for the Microbiologist III Classification or higher. The Laboratory Evaluation Officer is responsible for performing on-site evaluations of milk laboratories. Currently, there are no certified milk laboratories in West Virginia. The laboratory evaluation officer also serves as the contact between the FDA-LQAB and the laboratory. The following are requirements to become a Laboratory Certification Officer:

1. The individual must be a State Government employee and demonstrate competence in evaluating analysts' performance of milk laboratory test methods as stated on the Official Milk laboratory Evaluation Forms (FDA-2400 series), and where appropriate, as described in *Standard Methods for the Examination of Dairy Products* and/or *Official Methods of Analysis of the Association of Official Analytical Chemists*, when accompanied by a representative of the Food and Drug Administration, Center for Food Safety and Nutrition, Office of Field Programs, Division of HACCP, Laboratory Quality Assurance Branch on a joint laboratory evaluation.
2. The individual must submit an acceptable written report of the milk laboratory

evaluation to the FDA, CFSAN, OFP, HACCP, LQAB within 60 days of the evaluation.

3. The individual must attend the next scheduled Milk Laboratory Evaluation Officers Workshop (FDA Course #303).
4. The individual must support the policies and decisions of the State milk regulatory agency for the purpose of conducting the enforcement activities of the State milk regulatory agency..
5. The individual must participate in Appendix N training.

Conditional approval of a State Milk LEO to evaluate laboratories will occur after compliance with criteria 1 and 2 and will be in effect until attendance at the next scheduled Milk Laboratory Evaluation Officers Workshop. Conditional approval will be terminated if the individual fails to attend the next scheduled workshop, without cause. Laboratory evaluations conducted by conditionally approved officers are official.

Recertification of State Milk LEO's will occur triennially and will be based on satisfactorily meeting the following criteria:

1. The individual must be a State Government employee and demonstrate continued satisfactory competence in evaluating analysts' performance of milk laboratory test methods as stated on the Official Milk Laboratory Evaluation Forms (FDA-2400 series), and where appropriate, as described in *Standard Methods for the Examination of Dairy Products* and/or *Official Methods of Analysis of the Association of Official Analytical Chemists*, when accompanied by a representative of the Food and Drug Administration, Center for Food Safety and Nutrition, Office of Field Programs, Division of HACCP, Laboratory Quality Assurance Branch on a joint laboratory evaluation.
2. The individual must submit an acceptable written reports of the milk laboratory evaluation to the FDA, CFSAN, OFP, Div. Of HACCP, LQAB within 60 days of the evaluation.
3. The individual must have all laboratory evaluation, proficiency test examinations, and reports current.
4. The individual must have prepared and transmitted, at least annually, a summary list of certified and approved analysts and procedures by laboratory to the state milk sanitation rating agency and the FDA, CFSAN, OFP, Div. Of HACCP, LQAB.
5. The individual is responsible for conducting the training of Appendix N supervisors.
6. The individual must attend the Milk Laboratory Evaluation Officers Workshop once every three years.
7. The individual must not fail, without cause, to attend the FDA Regional Milk

Seminar.

State LEO's who lose certification cannot be re-certified for a period of 60 days from the date of loss of certification. Recertification will require meeting the requirements for initial certification.

Attachment 1

WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES

PERFORMANCE EVALUATION FORM

EMPLOYEE NAME SS. NO.

BUREAU/OFFICE DIVISION

EVALUATION PERIOD TO JOB TITLE

1 - Unsatisfactory 2 - Fair 3 - Satisfactory 4 - Very Good 5 - Excellent

All ratings should have remarks; however, ratings of 1, 4, or 5 must be justified in the remarks column.

CATEGORY	RATING	REMARKS
Dependability: • *Trustworthy and reliable in completing assignments.* • *Produces an amount of work commensurate with expectations and job standards.* • *Observes policies in completing assignments.* • *Meets deadlines.*		
Quality: • *Performs both routine and non-routine duties to the best of his/her ability to produce highest quality work.* • *Possesses required knowledge, skills, and ability to perform duties.* • *Follows all appropriate policies and safety procedures.* • *Adapts well to changes in procedures, rules and work methods.* • *Work is neat and orderly.*		
Judgement: • *Makes sound decisions according to agency policies, rules, and regulations.* • *Reacts well to problem situations and is able to make good decisions.* • *Consistently obtains and analyzes pertinent facts and makes correct decisions accordingly.* • *Takes appropriate action for unusual situations (refers to a supervisor, consults with other appropriate persons, etc.).*		
Initiative: • *Seeks and follows methods for self-improvement.* • *Is a self starter and works with minimum supervision.* • *Consistently promotes the agency and looks for ways to improve efficiency.* • *Presents a favorable job attitude.*		

CATEGORY	RATING	REMARKS
Communication: • *Able to describe and explain work situation.* • *Able to listen and understand instructions as to content and logic.* • *Asks appropriate questions and clarifies items which are unclear.* • *Keeps supervisor advised of necessary information and unusual situations.*		
Cooperation: • *Gets along and works harmoniously with co-workers and other employees.* • *Deals pleasantly and effectively with all persons.* • *Works with supervisor to develop as an employee.*		
Use of Time: • *Requests and uses leave in proper manner.* • *Reports to work on time.* • *Observes time limits for meal and break periods.* • *Leaves work no earlier than established ending period.*		
Supervisory/Managerial Ability: • *Delegates appropriate work and/or responsibilities to subordinates.* • *Trains and develops subordinates.* • *Sets a good example and motivates subordinates.* • *Deals courteously and diplomatically with employees, co-workers, the public, and the staff of other agencies.*		

# CATEGORIES SCORED:	TOTAL POINTS:	EVALUATION SCORE:

GOALS FOR THE EMPLOYEE:

Immediate
Supervisor's Signature _____ *Date* _____

ACKNOWLEDGMENT: I have reviewed this evaluation and the stated performance goals with my supervisor. I understand what improvements are needed before the next evaluation.

Employee's
Signature _____ *Date* _____

Administrator's
Signature _____ *Date* _____

Laboratory Safety -

I. Introduction -

Laboratory safety is every employees responsibility. This section of the manual deals with all aspects of safety including: personnel, personnel training, emergency phone numbers and contacts and safety equipment. Also included in this section are discussions on general laboratory safety practices and protocol, Material Safety Data Sheets (MSDS), disposal of hazardous waste and safety audits.

II. Personal Protection -

1. Laboratory Coates

Upon employment, each new Microbiologist and/or Laboratory Assistant are fitted for Lab Coates. Each new employee is ordered three new Lab Coates by the Fiscal and Inventor Management Section. Dirty Lab Coates are picked up once a week by the contracted laundry service. Clean Lab Coates are returned to the Lab Coat Room located just off the lobby. Dirty Lab Coates can be dropped off in the laundry hampers located in the Men's and Women's Rest Rooms or in the laundry hamper in the Lab Coat Room. If the Lab Coates are infected with infectious material, they are to be placed in bags and autoclaved before placing them into the hampers.

Buttoned Lab Coates are to be worn when examining samples and handling chemical and reagents.

2. Protective Eye Ware

All employees have access to protective eye ware. Eye protection is to be worn when working with hazardous material.

3. Hand Protection

All employees have access to latex gloves. Gloves must be worn when dealing with hazardous material such as:

A. Staining DMSCC Slides
B. Working with Ethidium Bromide (Dye for the Foss 90)

Some employees find working with the Colilert Reagent irritating to the skin. In this case, gloves may be worn.

Gloves can be worn at any time and for any reason if an employee wishes.

4. Fume Hood

A fume hood is located in the New Born Screening Section. This hood is to be used for staining DMSCC slides until the Environmental Microbiology Section can have a hood installed.

III. Personnel Training -

1. Hand out materials

Upon employment, each new employee is given a packet of safety materials including the *Right to Know* booklet.

2. Video Tapes

Upon employment, each new employee is given a list of the following videos to be viewed:

A. *Laboratory Safety and Infection Control*
B. *Protecting Yourself from AIDS* (2 parts)
C. *Hazard Communication:...Right to Know*
D. *OSHA's Safety Standard*
E. *Chemical Safety Measures, Spills and Disposals*
F. *Handling Hazardous Chemicals*

The above items are checked off in the *Orientation Manual for the New Employee* by the Laboratory Safety Officer.

3. Shelter-In-Place

Shelter-In-Place Training is provided for the Office of Laboratory Services by the Safety Committee. Random Shelter-In-Place Drill are held by the Safety Committee.

IV. Telephone

1. Emergency Telephone Numbers:

A.	EMS	911
B.	Lab Director (Office)	Extension 11
	Dr. Lambert (Home)	346-1582
C.	Maintenance (Office)	Extension 30
	Larry Hughart (Home)	988-1829
D.	So. Chas. Police Dept.	744-4666
E.	So. Chas. Fire Dept.	744-4666
F.	Thomas Memorial Hospital	766-3600
G.	Poison Control	348-4211

2. Bomb Threat Procedure

A. Be Calm - Then
B. Keep the caller on the line as long as possible.
C. Complete the data on the FBI DATA FORM (Attachment #1)
D. Immediately call director at telephone 11 or associate directors at numbers 23, 35 or 12. The decision t evacuate will be make by the director's office. If evacuation is necessary, follow the same instructions as for fire.
E. The director's office will notify the local police and other state officials of the bomb threat.

Note: If a bomb threat occurs on a weekend of holiday, call 911 or South Charleston Police 744-4666 immediately, notify other in building and evacuate. To use the OLS paging system, dial "#", "0")

Both items above are posted by all telephones.

V. Safety Equipment

The Environmental Microbiology Section has access to the following safety equipment:

1. Fire Extinguishers
2. Fire Blanket
3. Mercury Spill Kits
4. First Aide Kit
5. Material Data Safety Sheets
6. Emergency Eye Wash Station
7. Telephones

8. Laboratory Coates
9. Flamable Chemical Storage Cabinets
10. Shelter-In-Place Kits

For the location of the items above, see Attachment #2.

VI. General Laboratory Safety Practices and Protocol -

1. Absolutely no food or drink is allowed past the double doors leading into the Technical Sections of the Laboratory. Food and drinks are to be stored in the designated refrigerators in the front of the building and not in refrigerators/freezes that are designated for laboratory specimens.

2. Only laboratory personnel are allowed past the double doors and into the Technical Sections. Visitors and guests are only allowed into the Technical Section with approval from the sections supervisor.

3. All analysts must wash their hands with antibacterial soap before beginning samples analysis. Analysts must also wash their hands upon completion of sample analysis and clean-up (before leaving the section).

4. Analysts must "wipe-down" table surfaces before and after all sample analysis with 70% Ethanol.

5. Contaminated Laboratory Coates are not permitted in the administrative part of the laboratory.

6. Fire Drills are randomly held by the maintenance department. Upon hearing the fire alarm, employees are to turn off the lights in the section, shut the doors and exit to the designated area. See Attachment #3.

VII. Material Safety Data Sheets (MSDS)-

MSD Sheets are kept in a three ring binder in the widow sill of the Milk Room (See Attachment #1). Copies are also kept in the Library in the front of the building. MSD Sheets are kept for the following:

1. L-W Stain; tetrachloroethane formula
2. Fluorophos Substrate; Alkaline Phosphatase Test
3. Fluorophos Substrate Buffer; Alkaline Phosphatase Test
4. 2-Bromo-2-Nitro-1,3-Propanediol (Bronopol)
5. Colilert

6. Quaternary Heterocyclic amino compound (FM Dye)
7. Davison Blue Indicating Gel
8. Triton X-100
9. Polystyrene Test Tubes (Tubes, Beta-Lactam and Ceftiofur)
10. Antimicrobial Drug (Standard, Lyophilized Beta-Lactam and Ceftiofur)
11. Aqueous Phosphate Buffer (Diluent for Standard)
12. Enzyme Conjugated Hapten (Tracer, Lyophilized, Beta-Lactam and Ceftiofur)
13. Buffered Saline with Stabilizers (Diluent for Tracer)
14. Organic dye and Dilute Peroxide Solution (Color Developer)
15. Detergent (Stop Solution)
16. Saline with Surfactant (Wash Concentrate)
17. Bath Clear
18. Buf-Fax Tablets (sesquicarbonate dihydrate)
19. Butyl Alcohol
20. Ethyl Alcohol
21. Immersion Oil
22. Indo-Fax (2,6 dichloroquinone-chlorimide and copper sulfate catalyst)
23. Lens cleaner
24. Magnesium Acetate
25. Methanol
26. Phos-phax (phenol-free disodium phenyl phosphate)
27. Potassium Dihydrogen Phosphate
28. Plate Count Agar
29. Violet Red Bile Agar
30. Brilliant Green Bile Broth
31. Nutrient Agar
32. Nutrient Broth
33. Tryptic Soy Broth
34. Lauryl Tryptose Broth
35. EC Medium
36. Brom Cresol Purple
37. Bromo Thymol Blue 0.04%

VIII. Safety Audits -

Random safety audits are performed by members of the safety committee. See Attachment #3 - "Audit Guidelines for Inspectors" and "Safety Audit - Laboratory Sections".

Attachment #1

FBI BOMB DATA CENTER

Questions To Ask:
1. When is the bomb going to explode?
2. Where is it right now?
3. What does it look like?
4. What kink of bomb is it?
5. What will cause it to explode?
6. Did you place the bomb?
7. Why?
8. What is your address?
9. What is your name?

Threat Language:

1. Well Spoken (Educated)
2. Incoherent
3. Foul
4. Taped
5. Irrational
6. Message read by threat maker

Record Exact Wording Of The Threat:

_____
_____
_____
_____
_____

Sex of Caller:_____ Race:_____
Age:_____ Length of Call:_____

Number At Which Call Is Received:

_____

Time:_____ Date:_____

Note Caller's Voice:
- ❑ Calm
- ❑ Angry
- ❑ Excited
- ❑ Slow
- ❑ Rapid
- ❑ Soft
- ❑ Loud
- ❑ Laughter
- ❑ Crying
- ❑ Normal
- ❑ Distinct
- ❑ Slurred

If Voice Is Familiar, Who Did It Sound Like?_____

Background Sounds:
- ❑ Street Noises
- ❑ Crockery
- ❑ Voices
- ❑ PA System
- ❑ Music
- ❑ House Noises
- ❑ Motor
- ❑ Office Machinery

Remarks:_____
_____
_____
_____
_____

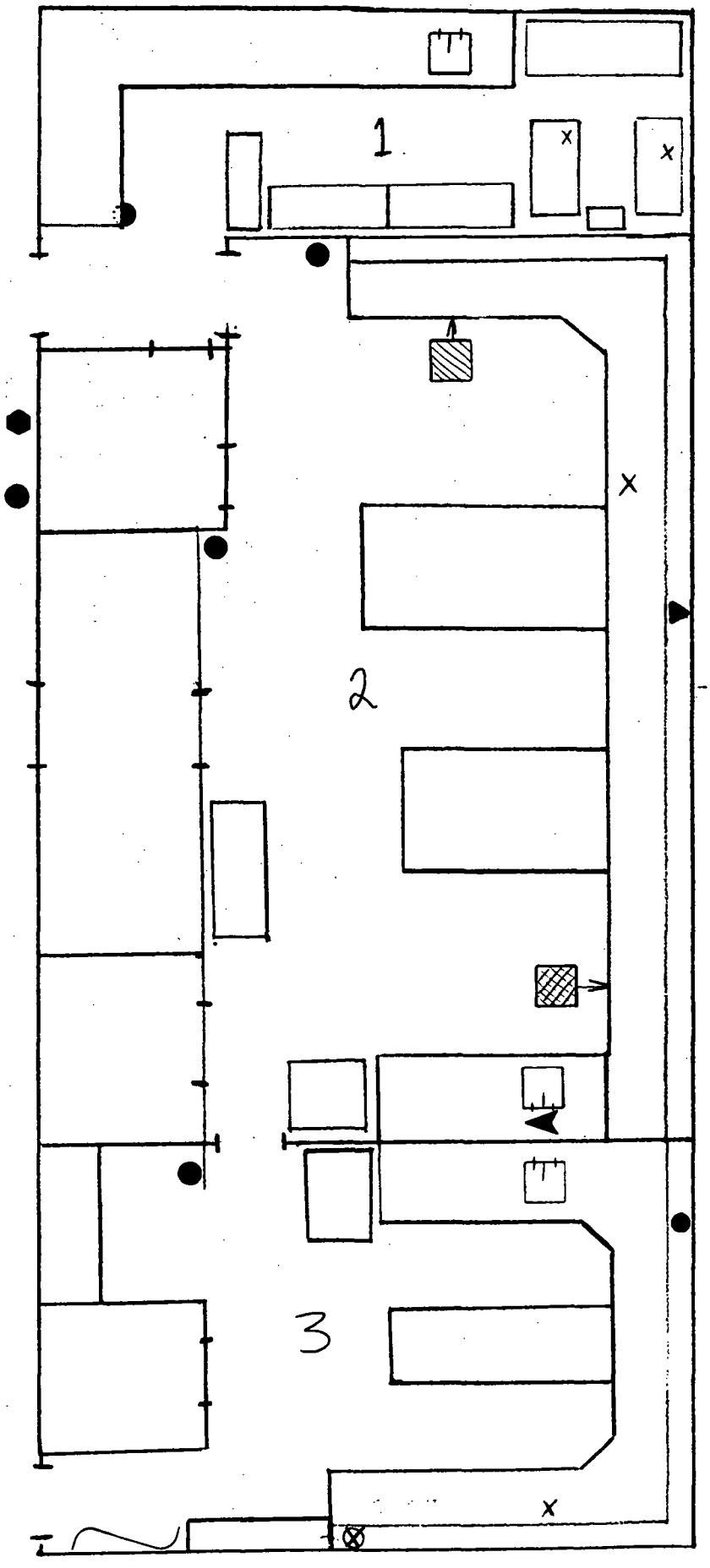
- ❑ Nasal
- ❑ Stutter
- ❑ Lisp
- ❑ Raspy
- ❑ Deep
- ❑ Ragged
- ❑ Clearing Throat
- ❑ Deep Breathing
- ❑ Cracking Voice
- ❑ Disguised
- ❑ Accent
- ❑ Familiar

- ❑ Factory Machinery
- ❑ Animal Noises
- ❑ Clear
- ❑ Static
- ❑ Local
- ❑ Long Distance
- ❑ Booth
- ❑ Other:_____

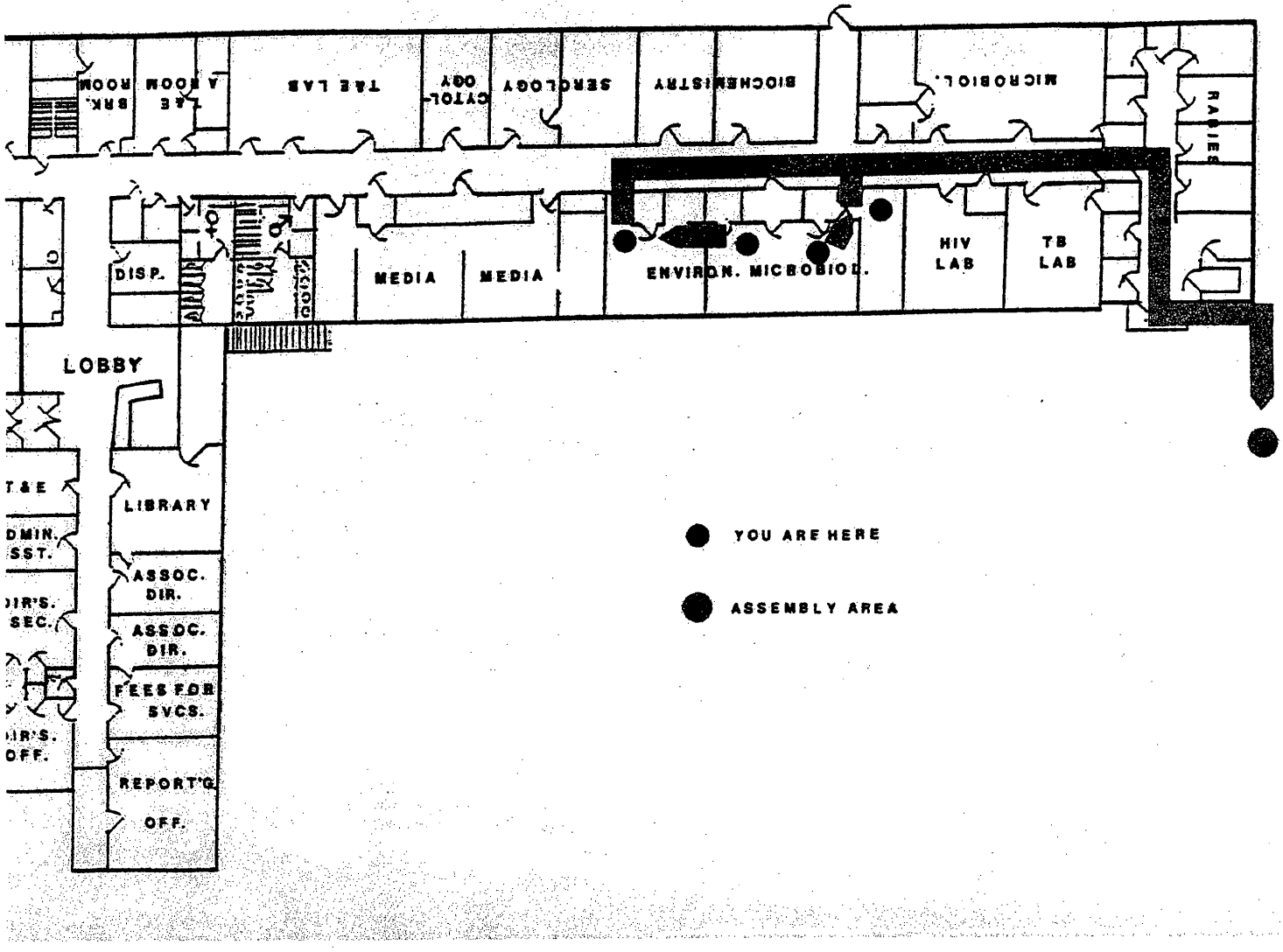
Attachment #2

Safety Equipment Location

1. Fire Extinguishers ⊛
2. Fire Blanket ●
3. Mercury Spill Kits ●
4. First Aid Kit ⬢
5. MSD Sheets ▲
6. Emergency Eye Wash ◀
7. Telephones X
8. Lab Coates ~
9. Chemical Storage (NH_4OH)
10. Chemical Storage (Ethanol)
11. Shelter-In-Place Kit ⊗



Attachment #3



Attachment #4

SAFETY AUDIT

AUDIT GUIDELINES FOR INSPECTORS

ITEMS TO ASK FOR:

_____ Safety Manual

_____ MSDS on a particular chemical

_____ Orientation packet locations/films

_____ Fire extinguisher tags

_____ BSC & fume hood maintenance records

_____ Past safety audits

_____ Incident reports

_____ Eye wash maintenance records

_____ Location of emergency supplies/equipment

_____ Spill kit

_____ Emergency Procedures - Bomb, Fire, Chemical

_____ Radiation monitoring documentation

_____ Hepatitis immunizations

_____ Employee suggestions

OBSERVE FOR:

_____ PPE compliance

_____ Possible Food locations - Refrigerators/Drawers, etc.

_____ Hazard labeling on chemicals (NFPA)

_____ General order of room

_____ Work practices

_____ Electrical problems

_____ Biohazard/Chemical warning signs

_____ Overfilled discard buckets & biohazard bags/appropriate items in each

_____ Proper Chemical Storage - Leak in fire cabinet/flammable areas heat or flame

____ Flammables kept away from heat/flame

____ 1. Flammables in safety cabinet

____ 2. Caustics (acid bases) on separate bottom shelf

_____ 10% bleach/Amphyl/Lysol IC - Freshly made

_____ Gas cylinders secured

_____ Storage of broken thermometers

_____ Fume hood sash height

WV OFFICE OF LABORATORY SERVICES
SAFETY AUDIT - LABORATORY SECTIONS

Section _____ Date: _____

Supervisor: _____ Inspector(s): _____

		Yes	Needs Action	N/A	Comments/Notes
GENERAL					
1.	Previous safety audit deficiencies corrected.				
2.	Cabinet doors and file drawers are kept closed when not in use.				
3.	Walkways and aisles are kept clear to prevent tripping & falling				
4.	Exits are visible & unobstructed				
5.	Storage of food and drink is prohibited in laboratory sections and areas where biological/chemical hazards exist. This applies to refrigerators, freezers, shelves, desk drawers, and benchtops.				
6.	Applying cosmetics and handling contact lenses is prohibited where biological/chemical hazards exit.				
7.	Trash is removed from the section in a timely manner.				
8.	Mouth pipetting is prohibited in each section.				
9.	Personal items such as books, purses. etc., are kept only in "clean" areas.				
10.	Appropriate hearing protection is used in section.				
11.	Laboratory injuries are documented on the Quality Awareness Forms within 72 hours of occurrence.				
12.	Syringe or vacutainer needles are not bent, broken or manipulated by hand.				
13.	Broken glass is never picked up by hand.				
14.	Clerical staff is instructed to avoid contact with infectious/chemical hazards.				

N/A - Not Applicable

	Yes	Needs Action	N/A	Comments/Notes
GENERAL (Continued)				
15. Are you familiar with the location and contents of the following items: ● Laboratory Safety Manual ● Safety Orientation Packet				
16. Chairs are in good condition.				
17. Safe step stools or ladders are used for climbing.				
18. Employees know location of the first aid kits?				
19. Employees allow centrifuge rotors to stop before opening lid. Centrifuge is never stopped by hand.				
20. When lifting heavy objects, do you bend at your knees and keep your back as straight as possible. (Back support belts are available to be used for extra support)				
INFECTIOUS/BLOOD-BORNE PATHOGEN HAZARDS				
21. The Laboratory Exposure Control Plan (OSHA Blood borne Pathogen Standard) is available and employees know where it is kept.				
22. Universal precautions are posted and practiced.				
23. Antimicrobial soaps are present in the section to utilize when washing hands.				
24. Sinks are in working order.				
25. Hand washing is done in the following instances: ● If hands become contaminated with blood or body fluids or other potentially infectious materials. ● When gloves are removed. ● After removing labcoat. ● Before leaving laboratory. ● Before performing tasks in "clean" areas.				

	Yes	Needs Action	N/A	Comments/Notes
INFECTIOUS/BBP HAZARDS (Continued)				
26. When packages that contain blood or other potentially infectious materials are shipped from the laboratory to another mailing address, they are appropriately packaged and a biohazard label is affixed to the outside of the package.				
27. Latex disposable gloves are worn: ● when handling items or surfaces soiled with blood or body fluids or other potentially infectious materials. ● when touching potentially infectious specimens (blood, body fluids, cultures, etc. ● when performing maintenance procedures on contaminated equipment. ● when operating instruments that test human blood.				
28. Biohazard warning signs are posted on laboratory entrances.				
29. Biohazard warning signs are used to identify the following contaminated materials: ● Centrifuges, laboratory instruments ● Containers used to store or transport regulated medical waste ● Refrigerators or freezers and incubators that hold potentially infectious materials are marked with biohazard labels. ● Containers used to store or transport contaminated materials				
30. Hepatitis vaccine has been offered to "at risk" employees.				
31. Employees are informed of exposure follow-up procedure				
32. Dilutions of disinfectants are made fresh daily. The bottles are properly labeled. (e.g. 10% bleach)				

	Yes	Needs Action	N/A	Comments/Notes
INFECTIOUS/BBP HAZARDS (Continued)				
33. Employees decontaminate work surfaces with appropriate disinfectant. ● immediately after completion of procedures. ● as soon as feasible when contaminated ● at the completion of each day.				
34. Equipment that becomes contaminated with blood or other potentially infectious materials is decontaminated immediately or as soon as possible with appropriate disinfectant (10% bleach, Lysol I.C. Amphyl) Bench disinfectant prepared according to manufacturer's recommendations.				
35. Discard containers containing disinfectant and microbiological waste are changed daily or according to the manufacturer's directions.				
36. Employees know the locations of the spill clean-up kits/disinfectants.				
37. Are infectious hazard spills cleaned up immediately and properly?				
38. Equipment is also inspected before it is repaired or shipped and decontaminated if possible. If it cannot be decontaminated before repair or shipment, staff has been instructed to attach a biohazard label that clearly identifies the site(s) of contamination.				
39. Laboratory biohazardous solid waste is disposed of in orange biohazard bags. ● A label is attached to the bag indicating the weight/section ● All orange bags containing biohazard waste are autoclaved before disposal. ● Bags are not filled more than 3/4 full. ● Bags have an air hole to prevent bursting in autoclave.				
40. Contaminated sharps (needles, broken glass, glass slides, cover slips, disposable pipers) are placed in a puncture-resistant container labeled with the biohazard symbol.				

	Yes	Needs Action	N/A	Comments/Notes
INFECTIOUS/BBP HAZARDS (Continued)				
41. Records are kept of autoclave performance. A log is kept of autoclave "runs". (Media, Micro)				
42. Procedures that may cause splashing, spraying, or splattering infectious agents are performed in a biological safety cabinet (BSC).				
43. BSCs are inspected on an annual basis. ● Documentation is provided.				
44. The following safety training tapes have been reviewed: ● Laboratory Safety and Infection Control ● Protecting Yourself from AIDS (2 parts) 1. What Everyone Needs to Know 2. Precautions for Laboratory Workers ● OSHA's Laboratory Standard Hepatitis B Videotape ● Blood-borne pathogen videotape ● Operation of the Laminar Flow Biological Safety Cabinet (CDC)* ● OSHA's Blood-borne Pathogens Standard				
45. Tissues, organs, and other body parts are placed in biohazard waste containers and sent for incineration or other approved disposal.				
CHEMICAL SAFETY				
46. The location of the Chemical Hygiene Plan is known				
47. Material Safety Data Sheets are readily available for each hazardous chemical in the section.				
48. Employees know how to use a MSDS				
49. Chemicals and reagents are properly labeled and dated. Label information includes NFPA hazard codes.				

N/A - Not Applicable

	Yes	Needs Action	N/A	Comments/Notes
CHEMICAL SAFETY (Continued)				
50. The least hazardous chemical appropriate for the procedure is used in the section.				
51. The least quantity of flammable or explosive chemicals are kept in the laboratory.				
52. Flammable chemicals are stored in fire safety cabinets or approved flammable safety containers with airtight seals.				
53. Flammables are kept away from open flames and other sources of heat.				
54. Oxidizing chemicals must be segregated from flammable solvents and fuels.				
55. Caustic and corrosive reagents (e.g. acids, bases) are stored in separate cabinets on the bottom shelves.				
56. Safety officer notified before chemicals are placed in chemical discard cabinet (located in hallway)				
57. Reagents are kept where there is little danger of being tipped over.				
58. To reduce accidents during transport throughout the laboratory, do you use the following safety precautions: ● Use a transport vessel, carrier or secondary container. ● Use a laboratory cart with specimen or reagent positioned away from the edge.				
59. Fume hood is free of clutter and supplies and equipment are kept at least 4 inches away from wood surface when in use.				
60. Fume hood performance is monitored.				
61. Fume hood sash height is maintained as low as possible.				
62. Gas cylinders are secured to the wall at all times.				
63. Employees know locations of chemical spill kits and mercury spill kits.				
64. Employees know how to use spill kits.				

	Yes	Needs Action	N/A	Comments/Notes
CHEMICAL SAFETY (Continued)				
65. The following training films have been viewed: ● Hazard Communication: The Chemical Worker's Right to know ● Chemical Safety Measures. Spills and Disposals ● Handling Hazardous Chemicals ● OSHA Formaldehyde Standard* ● Laboratory Hoods (SAVANT)*				
66. Broken mercury thermometers and spilled mercury are stored for disposal in a closed container.				
67. Ether is purchased in the smallest practical size.				
FIRE & CHEMICAL EMERGENCIES				
68. The location of the following is known to employees: 1. Fire extinguisher 2. Pull alarm stations 3. Personnel evacuation check lists and walkie talkie(s) 4. Fire escape routes 5. Shelter-In-Place supply box for section.				
69. Fire extinguisher is serviced, maintained and tagged at interval not to exceed one year.				
70. Fire extinguisher is free from obstruction or blockage and mounted.				
71. Bomb threat procedure is known to all employees.				
72. Emergency phone numbers are accessible to employees.				
ELECTRICAL SAFETY				
73. Electrical connections are functioning properly.				
74. All lamps are kept free of combustible materials.				

N/A - Not Applicable

		Yes	Needs Action	N/A	Comments/Notes
ELECTRICAL SAFETY (Continued)					
75	There is no evidence of fraying on any electrical cords.				
76.	Rubber cords kept free of grease, oil, and chemicals.				
77.	Cords are not left near heat or water				
78.	Plugs are not overloaded				
79.	Extension cords are not used.				
80.	Cords are secured to prevent tripping.				

YOUR SAFETY RELATED SUGGESTIONS:

N/A - Not Applicable

Sample Handling

I. Introduction -

Sample Handling is a critical aspect of the examination process. Without maintaining sample integrity, test result are meaningless. This section deals with all aspects of sample handling for both the Water and Milk Programs. Discussions will be included on Sampler Training, Sample Scheduling, Sample Collection, Transportation, Sample Accession, Storage and Disposal.

II. Training for Samplers -

1. Water samples are received from water plant operators, district engineers, county and state sanitarians, contracting firms, business owners and private individuals. To submit samples for Compliance (compliance with the Safe Drinking Water Act), and individual must have at minimum a Class 1-D Operators License.

   Training is provided in the following manner:

   A. Water Plant Operators - Receive training at the Water Plant Operators Course held at the Environmental Training Center in Ripley, WV.

   B. District Engineers - Receive on-the-job training.

   C. County and State Sanitarians - Receive training at the Sanitarian Training Course held at the Office of Environmental Health Services. They also receive on-the-job training.

   D. Business Owners - People that own establishments that have their own wells that serve the public must receive training from the Office of Environmental Health Services, Environmental Engineering Division.

   E. Contracting Firms and Private Individuals - Receive no formal training but are provided detailed instructions on the back of the Water Bacteriological Report Form.

2. Milk samples are collected only by county and state sanitarians. State sanitarians pick up raw milk and IMS pasteurized milk. County sanitarians pick up pasteurized milk that is being shipped into their counties (non-IMS). Most state sanitarians start out working in the counties. Training for both is as follows:

A. On-the-job training by senior sanatarians.

B. Sanitarian Training Course held at the Office of Environmental Health Services.

III. Sample Scheduling

1. Water Samples

Water samples for compliance purposes are submitted based on schedule setup by the Office of Environmental Health Services - Environmental Engineering Division. Other types of water samples are not scheduled. Clients are discouraged from submitting samples on Weekends.

2. Milk Samples

The milk schedule is set up by the Environmental Microbiology Supervisor and the Assistant Director for Public Health Sanitation for six month periods (January to June and July to December). The schedule is broken down into three categories: Raw Milk, IMS Pasteurized and Pasteurized from the County Health Departments (non-IMS). The counties are further broken down into two groups. Raw milk and IMS pasteurized milk is each scheduled 5 weeks in a 6 month period. Pasteurized milk from the counties is scheduled 8 weeks in a 6 month period (4 weeks for each group). A total of 36 weeks a year is allocated for milk examination. Approximately one month before a sampling period, a letter is sent to all milk sample collectors indicating sampling dates (See Attachment #1). Any dates that are unacceptable may be rescheduled or cancled.

IV. Sample Collection

1. Water Samples

A. Water samples are to be collected only in vessels supplied by the Office of Laboratory Services. There are two types of collection vessels used - a 4 oz. nalgene bottle that is laboratory processed and reused and clear, disposable vessels provided by IDEXX. Only by special permission of the section supervisor may another type of bottle be used.

B. Collection vessels are mailed out to clients of the Office of Laboratory

Services by the Container Section. Collection vessels may also be picked up in person by stopping by the laboratory.

C. Sample collection must be performed as described in Attachment #2.

D. After sample collection, the Water Bacteriological Report Form (EM-1) Attachment #3 is to be completed as described in Attachment #4.

2. IMS Pasteurized Milk

A. IMS Pasteurized Milk is received from only three sources - United Valley Bell, Broughton's Dairy (closing, Fall 1999) and Barker's Dairy. The Environmental Microbiology Supervisor and the Assistant Director for Public Health Sanitation set up the milk sampling schedule for six months at a time. 10 weeks per year are allotted for IMS Pasteurized Milk. Milk from United Valley Bell and Broughton's Dairy are collected by state sanitarians while Barker's Dairy's Milk is collected by the Logan County Sanitarian.

B. Samples are collected in their original containers. Samples larger than 1 gallon may be sub-sampled. Samples are placed in large coolers filled with crushed ice. The top of the container must not be below the surface of the ice. A temperature control must be included and must be at least ½ the size of the largest container.

C. The Pasteurized Milk Form, PM-98 must then be completed. See Attachment #5.

3. Pasteurized Milk

A. Pasteurized Milk shipped into West Virginia is picked up by the County Sanitarians. The Environmental Microbiology Supervisor and the Assistant Director for Public Health Sanitation set up the milk sampling schedule for six months at a time. Counties are divided into two groups (III and IV). 8 weeks per year per group are allotted for these samples.

B. These samples are sub-sampled into sterile vaccutainers by the method described in Attachment #6.

C. The Pasteurized Milk Form, PM-98 must then be completed. See

Attachment #5.

D. Samples are then packed into the Transtemp Shipping Cases and delivered to the laboratory. See Packing Diagram, Attachment #7.

4. Raw Milk

A. Raw Milk is received from state sanitarians and occasionally from a representative from the co-op. The Environmental Microbiology Supervisor and the Assistant Director for Public Health Sanitation set up the milk sampling schedule for six months at a time. 10 weeks per year are allotted for Raw Milk.

B. Raw milk is collected and received in either sterile whirl pack bags or sterile plastic vials. A temperature control must be included.

C. The Raw Milk Form, RM-95 must then be completed. See Attachment #8.

D. Samples are then packed into the Thermo Safe Shipping Cases and delivered to the laboratory. See Packing Instruction - Attachment #9.

V. Sample Accession -

1. Water Samples

A. Delivery

90% of samples are picked up from the South Charleston Post Office by maintenance personnel and delivered to the General Reporting Office where the samples are sorted according to the appropriate laboratory sections. Samples that are shipped to the laboratory by other courriers (UPS, FedEx or Airborne) are delivered to the Fiscal and Inventory Management Section and then delivered to Environmental Microbiology. Samples are also brought in to the laboratory by clients and left at the front desk throughout the day. The receptionist notifies the section each time samples are left at the front desk.

B. Sorting and Accession

Upon receipt by the Environmental Microbiology Section the samples are sorted according to Test Method and Sample Codes. See Attachment #10 for a list of Test Methods and Sample Codes and Attacment #11 Test Method Chart. Sample vessels are set on top of the water bacteriological report form (they must be kept together). A three digit number sticker is placed on top of the sample vessel (the last three digits of the 5 digit laboratory number) and the water bacteriological report form is stamped with the laboratory number and date received. The water bacteriological report from is then marked with the test method, time received, initials of analysts receiving samples, analysis date and time and initials of analysts performing the analysis.

C. Data Entry

Water bacteriological report forms are then entered into the computer using Microsoft Access. The following fields are entered:

a. Lab Number
b. Test Method and Sample Code
c. County of Origin
d. Date of Collection, Receipt and Analysis
e. Supply
f. Mailing Address
g. Collector
h. Public Water Supply ID Number
i. Sampling Point
j Compliance, Special Purpose or Repeat

The data base is used for printing the daily worksheets, locating samples for phone inquiries and compiling monthly reports.

D. Sample Rejection

Water samples will not be analyzed for any of the following reasons:

a. Exceeded Time (30 hours for compliance with the SDWA and samples requiring counts, 48 hours for all others)
b. Sample Contains < 100 mL
c. Insufficient Information (No date and time of collection or no phone number)
d. Sample contains residual chlorine

e. Insufficient air space to facilitate mixing
f. Unauthorized Collector

For any samples not analyzed, a replacement sample is requested.

2. Milk Samples

A. Delivery

Milk samples must be received by the laboratory by noon on Wednesday of any given week unless prior notice is given.

1. County milk samples are picked up from the South Charleston Post Office by the maintenance personnel and then delivered to the Environmental Microbiology Section. Some county milk samples are received from UPS or FedEx or even hand-delivered to the laboratory.

2. Raw milk is either received from an overnight courier service or hand delivered.

3. IMS pasteurized milk is hand-delivered to the laboratory.

B. Sorting and Accession

Samples must be listed as either Official or Un-Official before any testing begins.

1. Upon opening the milk case, immediately check the temperature control with a pre-cooled thermometer (in a beaker with ice and water).

2. The date, time and temperature of receipt along with the initials of analysts receiving the samples are recorded at the bottom of the forms (PM-98, RM-95).

3. Samples are kept cold at all times. Raw milk and pasteurized milk from the counties are placed in ice baths while sorting and numbering them. IMS pasteurized milk is loaded directly onto carts and taken immediately to the sliding door refrigerator in the milk

room.

4. Milk samples are given a laboratory use number (starts with #1 each week) that reflects the order of accession. The milk samples are labeled with a sharpie and the corresponding forms are marked with identical numbers.

5. Milk samples are sorted and grouped (according to test type, Attachment #12) in the following manner:

   a. All conventional and flavored milk (whole, 2%, 1%, skim, chocolate, strawberry etc.) are grouped together.

   b. All half and half products (half and half, mixes and creams) are grouped together.

   c. All butter milks are grouped together.

   d. All other cultured products (cottage cheese, sour cream, dips and yogurt) are grouped together.

6. Once samples are grouped in the sliding door refrigerator, the samples are listed on the dry erase board under the appropriate headings (Conventional, Half and Half, Butter Milk, Cultures and Raw).

7. Sample information is then entered on the appropriate worksheets (lab use number, country or district, and sample type). There are three type of worksheets:

   a. IMS Pasteurized, Attachment #13
   b. Pasteurized from Counties (Same as IMS Pasteurized but listed as non-IMS in the heading)
   c. Raw, Attachment #14

C. Sample Rejection

Reject samples for any of the following conditions:

a. Not temperature control (Note: a sample may be sacrificed and

used as a temperature control)

b. The temperature control in not at least one half the size of the largest container.

c. Samples are frozen.

d. Samples received above temperature (4.4°C for IMS Pasteurized and Raw, 7.0°C for Pasteurized Milk from the counties). IMS Pasteurized and Raws may be analyzed above 4.4°C if:

   i. Samples were collected within 3 hours and

   ii. Receipt temperature is not higher than the temperature of collection and

   iii. Temperature does not exceed 7.0°C.

e. Samples cannot be analyzed within 48 hours of collection.

VI. Sample Storage

1. Water Samples

Water samples are analyzed immediately upon sample accession unless they are received after 2:30 pm. Samples received after 2:30 pm are stored in a wire basket in the sliding door refrigerator loceated in the Milk Room at 0.0 - 4.4°C (as long as the holding times will not be exceeded); unless the holding time will expire by the next morning or results are needed the next day as in the case of a "Boiled Water Advisory", then those sample will be analyzed up until 4:30 pm using Colilert 18.

2. Milk Samples

Milk samples are stored in sliding door refrigerator located in the Milk Room at 0.0 - 4.4°C until they can be tested. After testing, the milk samples are stored in the "walk-in" refrigerator, also located in the Milk Room. The milk samples are to remain in the "walk-in" refrigerator until all analysis is complete (plates read and recorded, slides counted, etc.).

VII. Sample Disposal

1. Water Samples

A. Excess water from water samples (sample remaining after use of 100 mL for analysis) is collected in wax buckets and disposed of down the sink unless sewage is suspected in which case the remaining sample is left in the vessel and is taken to the Media/Glassware Section for autoclaving .

B. All multi tube fermentation tests (100 mL, 10 tube and dilutions), are taken to the Media/Glassware Section for autoclaving and reprocessing.

C. Negative Colilert 100 mL samples are poured down the sink and the vessels disposed of in the hard trash.

D. Positive Colilert 100 mL samples have > 2mL of bleach added to them, mixed, and left overnight, then poured down the sink and the vessels disposed of in the hard trash.

E. Quanti Trays are placed into autoclave bags and taken to the back autoclave for disposal.

F. HPC plates are placed into autoclave bags and taken to the back autoclave for disposal.

G. Nalgene sample vessels are taken to the Media/Glassware section for washing, autoclaving and reprocessing.

2. Milk Samples

A. Raw milk samples are placed in brown paper bags, then into trash bags and disposed of in the dumpster.

B. Vacutainer tubes from county milk samples are placed in wax buckets and disposed of in the large hard trash container in the Media/Glassware Section.

C. Pasteurized milk and milk products in original containers are offered to employees. Any milk samples not taken by employees is disposed of in the hard trash in the Media/Glassware Section (fluid milk is poured down the

sink before the containers are discarded.

D. SPC and Coliform plates are placed into autoclave bags and taken to the back autoclave for disposal.

E. Delvo P 5 Packs are placed into autoclave bags and taken to the back autoclave for disposal.

F. The contents of Scharer Rapid Phosphatase tubes are emptied into a wax bucket and disposed of into the hard trash in the Media/Glassware Section.

G. Lactek Tubes are placed into wax buckets and disposed of in the hard trash.

Chromogenic/Fluorogenic Substrate Test (Colilert 100 mL)

I. Introduction -

Colilert Reagent is used for the simultaneous detection and conformation of total coliforms and *E. coli* in water, which is based on the Defined Substrate Technology (DST). DST utilizes indicator-nutrient which cause target microbes contained in the sample and incubated in the DST reagent system to produce a color change (or another signal i.e., fluorescence), both indicating and confirming their presence.

II. Sample Requirements-

1. For Compliance Samples: Maximum allowable elapsed time between sample collection and sample analysis is thirty (30) hours.

   For Non-Compliance: Maximum allowable elapsed time between sample collection and sample analysis is forty eight (48) hours.

2. Reject samples for any of the following reasons:

   A. Insufficient air space to facilitate mixing of sample.
   B. Sample contains residual chlorine. (Blue flash appears)
   C. Sample exceeds maximum allowable time requirements.
   D. Information on the Water Bacteriological Report Form (EM-1) is insufficient. (No date or time of collection)
   E. Sample container was not furnished by the Office of Laboratory Services.

III. Sample Types -

1. Repeat/Replacement Samples
2. Special Purpose Samples
3. Private Samples
4. Home Loans
5. Bottled Waters
6. Swimming Pools
7. Flood/Disaster Samples

IV. Reagents and Equipment -

1. 35.0° ± 0.5°C Incubator. (Walk-In or Environette)

2. Long wavelength (366 nm) Ultraviolet Lamp.
3. Color and fluorescence comparator.
4. Clear, sterile, non-fluorescent 120 mL bottle. (Graduated at the 100 mL mark)
5. Colilert Reagent.
6. 70% Ethanol

For Quality Control:

1. Inoculating loop.
2. Nutrient Agar Slants of the following organisms:
   A. *Pseudomonas aeruginosa*
   B. *Klebsiella pneumoniae*
   C. *E. coli*
3. Tryptic Soy Broth. (TSB)

V. Procedure -

1. Sanitize area with 70% Ethanol and wash hands.

2. Aseptically, add Colilert Reagent to appropriate test bottles (See Item IV - 4). One packet of reagent per test bottle. An estimated number of bottles may be prepared in advance (first thing in the morning) in anticipation of the daily work load. Prepared bottles must be used within 30 hours and stored in the dark (if not used the day they are prepared).

3. Shake sample 25 times within seven (7) seconds with a one (1) foot movement.

4. If the sample is originally in an opaque nalgene bottle, remove the laboratory number sticker and place it on the lid of the test bottle. Remove the sample bottle lid and discard it into a wax bucket. Remove the test bottle lid and while holding it with one hand (do not lay the lid on the table or touch the inside), pour the sample into the test bottle up to the 100 mL line and replace the lid

Or

If the sample arrives already in one of the test bottles, remove the lid (do not lay the lid down - hold the lid in the same hand that holds the pipet bulb) and using a sterile 10 mL pipet, remove and discard excess sample (down to the 100 mL mark), set lid back on test bottle. Raise the lid and aseptically add a packet of colilert reagent.

5. Shake test bottles until colilert reagent dissolves and place in metal basket. Metal baskets will hold 15 test bottles. When metal basket is full or all samples are done (if < 15 samples), write the date and time on a piece of masking tape, place it on the basket and place the basket in the 35.0°C incubator (Walk-In).

6 Incubate samples for 24-28 hours at 35.0±0.5°C.

Test Results

1. Remove samples from the incubator after 24 hours incubation. Samples must be removed from the incubator with 28 hours.

2 Examine samples for the presence of a yellow color (confirming the presence of coliform bacteria) that is equal to or greater than the compartor. Samples that are slightly yellow, but not as yellow as the comparator, must be place back into the incubator to incubate for the full 28 hours. Samples left in the incubator for more than 28 hours must be reported as "Laboratory Accident" unless they are clear.

3. If a sample has a yellow color equal to or greater than the comparator, then a +1 is to be recorded in the "CONF/COLI" column and a "P" in the "Total" column of the colilert bench sheet. The sample is considered "Total Coliform Positive".

4. All Yellow Samples (Total Coliform Positive Samples) must be taken into the Walk-In Incubator and checked for fluorescence with the 366 nm UV light. Samples with fluoresce equal to or greater than the comparator are Positive for *E. coli* and must be marked on the lab number label with a pen or marker. The samples that fluoresce must then be marked with a +1 in the "EC/FC24" column and a "P" in the "ECOLI" column on the colilert bench sheet. If the sample did not fluoresce, then it must then be marked with a -1 in the "EC/FC24" column and an "A" in the "ECOLI" column on the colilert bench sheet.

5. If a sample is clear (Negative for Total Coliforms) then record on the bench sheet the date that the sample analysis was completed in the "RPT DATE" column and the analysts initials (analyst reading the results) in the "INT" column.

   Note: The report date and analysts initials may be recorded on the top line and then arrows drawn down. See example on Attachment #1.

6. After the data has been entered on the bench sheet for a particular sample then the Water Bacteriological Report Form (EM-1) is to be completed. Total Coliforms

are to be marked as "Present" or "Absent". *E. coli* only has to be marked as "Present" or "Absent" if Total Coliforms are Present.

7. After all EM-1 forms are marked, they are to be placed in the basket labeled "Forms To Be Checked".

8. All forms are to be checked by a Microbiologist II or higher. All samples with Total Coliform Positive Results must be initialed by the analyst checking them on the bench sheet. Initials are to be placed to the right of the initials of the analyst reading the test. (See Attachment #1).

VI. Quality Control

Test Bottles -

1. Each lot of Colilert Test Bottles received must be checked. (See Attachment #2)

2. Record the "Date of Check" and the "Lot Number" on the "Quality Control - Colilert Bottles" Form in the Water QC Book.

3. Check three (3) bottles from each lot for sterility by adding 25 mL of Tryptic Soy Broth to each bottle, incubate at 35.0 ± 0.5°C for 24 hours. After the 24 hours, examine bottles for signs of growth (Turbidity). Record results in the "Sterility" Column as "Number of Bottles", "A" (Absent-No-growth) or "P" (Positive - Turbid). If any bottles test Positive, recheck three (3) more bottles. If any bottles on the recheck test positive, contact the Supervisor.

4. Verify the 100 mL mark on one (1) bottle from each lot by filling the bottle to the 100 mL mark with water then pour into a Class A graduated cylinder. If volume reads 100 ± 2.5 mL, place a "✓" in the "100 mL" Column (the 100 mL mark can be used to measure the sample volume); if the volume reads outside of the 100 ± 2.5 mL range, place an "X" in the column (the 100 mL mark cannot be used to measure the sample volume).

5. Check one (1) bottle from each lot (can be the same bottle that is used for the volume check) for autofluorescence by examining the bottle in the dark in the Walk-In Incubator with the 366 nm UV light. Place a "✓" in the "Autofluorescence" column if the bottle does not fluoresce and an "X" if it fluoresces. If the bottle fluoresces, then check another from the same lot. If the recheck fluoresces, contact the Supervisor.

For Colilert Reagent -

1. Each lot of Colilert Reagent must be checked before use with controls. (See Attachment #3)

2. Record "Date Received", "Date Tested" and "Lot Number" on "MMO-MUG Quality Control" Form.

3. Aseptically add one (1) packet of colilert reagent to 100 mL of sterile water in a colilert test bottle and shake to dissolve completely.

4. Divide into thirds using two (2) more colilert test bottles.

5. Label the first bottle "Pseudo", the second bottle "Kleb." and the third bottle "*E. coli.*

6. Obtain 18 to 24 hour old nutrient agar slants of *Pseudomonas aeruginosa, Klebsiella pneumoniae* and *E. coli.*

7. Using a sterile inoculating loop touch the surface of one of the nutrient agar slants and then inoculate the appropriate colilert test bottle. Repeat for the two (2) remaining nutrient agar slants.

8. Incubate test bottles at 35.0 ± 0.5° for 24 to 28 hours.

9. Record results on the "MMO-MUG Quality Control" form using the following codes: "-" = No Color; "+" = Yellow Color; "+F" = Fluorescence; and "-F"= No Fluorescence.

   Note: Results should be as follows:

   Pseudomonas = "-"
   Klebsiella = "+, -F"
   E. coli = "+, +F"

   If results do not match above, retest. If retest does not match above results, contact Supervisor.

10. Record initials in the "Analyst" column when recording the results.

Attachment #1
Colilert Bench Sheet

COLILERT 10/6/98

6222	3A	CLAY	10/5/98	10/5/98	10/6/98	PROCIOUS PS	DOUGLAS	PROCIOUS POS					K-74	64	
6223	3A	CLAY	10/5/98	10/5/98	10/6/98	CLAY-ROANE-	DOUGLAS	FRANKIE ASBU							
6224	3A	CLAY	10/5/98	10/5/98	10/6/98	CLAY-ROANE-	DOUGLAS	TERRY RHODE							
6225	3A	CABELL	10/5/98	10/5/98	10/6/98	CAMP ARROW	MARTINO	OUTDOOR SINK							
6382	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #17							
6383	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #4							
6384	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #18							
6385	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #49							
6386	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #52							
6387	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #13							
6388	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #11							
6389	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #76							
6390	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #11							
6391	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #47							
6392	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #81							
6393	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #17							
6394	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #91							
6395	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #16							
6396	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #16							
6397	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #79							
6398	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #14							
6399	3A	FAYETT	10/5/98	10/6/98	10/6/98	DANESE PSD	PUGH	LAYLAND POST							
6400	3A	JACKSO	10/5/98	10/6/98	10/6/98	COTTAGEVILL	HOLCOMB	RESIDENCE KIT							
6401	3A	NICHOL	10/5/98	10/6/98	10/6/98	UNITED WELD	WALLS	CUSTOMER #13							
6402	3A	MCDOW	10/5/98	10/6/98	10/6/98	MCDOWELL C	WHITTAKE	TANK							
6403	3B	GREENB	10/5/98	10/6/98	10/6/98	KEVIN HOLLI	ELTZROTH	KITCHEN SINK							
6404	3B	GREENB	10/5/98	10/6/98	10/6/98	KYLE BOSWEL	ELTZROTH	KITCHEN SINK	+1	-1	P	A			
6405	3B	GREENB	10/5/98	10/6/98	10/6/98	MAE WOODRU	ELTZROTH	BATHROOM SIN							
6406	3B	POCAHO	10/5/98	10/6/98	10/6/98	DESSIE CARP	RILEY	SINK TOP	+1	-1	P	A			
6407	3B	WOOD	10/5/98	10/6/98	10/6/98	EILEEN P HAI	SMITHSON	KITCHEN SINK	+1	-1	P	A			
6408	3B	BRAXTO	10/5/98	10/6/98	10/6/98	ROLAND RAM	SMITH	BATHROOM SPI	+1	+1	P	P			
6409	3B	MASON	10/5/98	10/6/98	10/6/98	LISA TEMPLE	FOWLER	KITCHEN	+1	-1	P	A			
6410	3B	TYLER	10/5/98	10/6/98	10/6/98	ROBERT TENN	TENNANT	KITCHEN SINK	+1	-1	P	A			
6411	3B	LEWIS	10/5/98	10/6/98	10/6/98	JEFF HULL	HAWKINS	JEFF HULL M.H							
6412	3C	GILMAR	10/5/98	10/6/98	10/6/98	LISA ULLOM	HEATER	KITCHEN HUD	+1	-1	P	A			
6413	3C	WETZEL	10/5/98	10/6/98	10/6/98	CENTURY 21	MURPHY	KITCHEN SINK							
6414	3M	WOOD	10/5/98	10/6/98	10/6/98	CINDY NUTTE	POWERS	KITCHEN SINK							
6415	3F	KANAW	10/5/98	10/6/98	10/6/98	UNITED VALL	PAULEY	1 GALLON COD					✓	✓	

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Attachment #2
Colilert Bottle - Quality Control Form

QUALITY CONTROL - COLILERT BOTTLES

- **Sterility:** Check Three (3) Bottles From Each Lot With Tryptic Soy Broth - Record Results As "A"- No Growth or "P"-Growth
- **100 mL:** Verify 100 mL Line With A Class A Graduate (One (1) Bottle/Lot) - Record Results As "✓" for = 100 mL or "X" for <100 mL
- **Autofluorescence:** Check One (1) Bottle With 366 nm, 6 Watt UV Light - Record Results As "✓" for No Fluorescence or "X" for Fluorescence.

Date	Lot #	Sterility	100 mL	Auto fluorescence	Date	Lot #	Sterility	100 mL	Auto fluorescence

Attachment #3
Colilert Reagent Quality Control Form

MMO-MUG QUALITY CONTROL

			24 Hour Results With 18 - 24 Hour Cultures				
Date Rec'd	Date Tested	Lot #	Pseudomonas aeruginosa	Klebsiella pneumoniae	E. coli	Analyst	Comments

Chromogenic/Fluorogenic Substrate Test (Quanti Tray)

I. Introduction -

Colilert Reagent is used for the simultaneous detection and conformation of total coliforms and *E. coli* in water, which is based on the Defined Substrate Technology (DST). DST utilizes indicator-nutrient which cause target microbes contained in the sample and incubated in the DST reagent system to produce a color change (or another signal i.e., fluorescence), both indicating and confirming their presence. By utilizing the Quanti Tray System and 97 well trays, an estimation of coliform and *E. coli* density ranging from < 1 to > 2,419.2 can be determined from a single 100 mL sample portion. Higher counts can be determined by diluting the sample and multiplying the result by the appropriate dilution factor.

II. Sample Requirements-

1. For Compliance Samples: Maximum allowable elapsed time between sample collection and sample analysis is thirty (30) hours.

   For Non-Compliance: Maximum allowable elapsed time between sample collection and sample analysis is forty eight (48) hours.

   For Raw Source Waters (Surface, Ground, Spring): Maximum allowable elapsed time between sample collection and sample analysis is (8) hours. If sample exceeds the 8 hours, it is to be analyzed; however, "EXCEEDED 8 HOURS" must be written under laboratory remarks. Samples exceeding 30 hours are not to be analyzed.

2. Reject samples for any of the following reasons:

   A. Insufficient air space to facilitate mixing of sample.
   B. Sample contains residual chlorine. (Blue flash appears)
   C. Sample exceeds maximum allowable time requirements.
   D. Information on the Water Bacteriological Report Form (EM-1) is insufficient. (No date or time of collection)
   E. Sample container was not furnished by the Office of Laboratory Services.

III. Sample Types -

1. Source Waters (Surface, Ground, Spring and Bottled)

2. Dairy Farms
3. Sewage Suspects
4. Recreational Waters (Bathing Beaches - Summer 2001)
5. Any Sample Requiring a Total and *E. coli* count
6. Swimming Pools requiring an estimation of coliform density
7. Flood/Disaster Samples requiring an estimation of coliform density

IV. Reagents and Equipment -

1. 35.0° ± 0.5°C Incubator. (Walk-In or Environette)
2. Long wavelength (366 nm) Ultraviolet Lamp.
3. Color and fluorescence comparator.
4. Clear, sterile, non-fluorescent 120 mL bottle. (Graduated at the 100 mL mark)
5. Colilert Reagent.
6. 70% Ethanol
7. Quanti Trays (97 well)
8. Quanti Tray Sealer
9. 99 mL Sterile Water Dilution Blanks (If Dilutions Are Required)
10. 10 mL Sterile Pipets (Samples Requiring a 10^{-1} Dilution)
11. 1.1 mL Sterile Pipets (Samples Requiring a 10^{-2} Dilution)

For Quality Control:

1. Inoculating loop.
2. Nutrient Agar Slants of the following organisms:
   A. *Pseudomonas aeruginosa*
   B. *Klebsiella pneumoniae*
   C. *E. coli*
3. Tryptic Soy Broth. (TSB) (Single Strength and Double Strength)
4. Brom Cresol Purple Solution

V. Procedure -

1. Turn on Quanti Tray Sealer. Green light will come on when sealer is ready (approximately 20 minutes).

2 Sanitize area with 70% Ethanol and wash hands.

3. Shake sample 25 times in 7 seconds with a 1 foot movement.

4. Determine the appropriate dilution from the following table:

Dilution	Sample Type
Full 100 mL Volume	1. Raw Source Waters (Ground) 2. Raw Source Waters (Springs) 3. Raw Source Waters (Bottled Waters) 4. Dairy Farms 5. Recreational Waters (Beaches - Pending Regulation Change) 6. Drinking Water (Public or Private) Requiring a Count
10^{-1}	1. Raw Source Waters (Surface)
10^{-2}	1. Sewage Suspects and Ditches where high counts are expected. If unsure, a full 100 mL and 10-2 may be run on the same sample giving a range of <1 to > 241,920.

For 100 mL:

5. Remove excess sample by pouring off or removing it with a 10 mL sterile pipet so that only 100 mL remains.

6. Add 1 packet of Colilert Reagent and shake to dissolve completely.

7. Label back of 97 well tray with the Lab Number, Date, Time and Dilution Factor (1X for 100 mL portion, 10X for 10^{-1} dilution or 100X for 10^{-2} dilution).

8. Pour sample into 97 well tray and tap on small wells to dislodge air bubbles.

9. Place tray in the rubber mold on the Quanti Tray Sealer and press "Seal".

10. Place in 35.0°±0.5°C incubator for 24 to 28 hours (27 to 28 perfered).

For 10^{-1} Dilutions:

1. Follow steps 1 - 4 from above.

2. Pipet 10.0 mL of sample into clear, sterile, non-fluorescent 120 mL bottle.

3. Fill to the 100 mL line with sterile distilled water.

4. Continue with steps 6 - 10 from above.

For 10^{-2} Dilutions:

1. Follow steps 1 - 4 from above.

2. Pipet 1.0 mL of sample into clear, sterile, non-fluorescent 120 mL bottle.

3. Fill to the 100 mL line with sterile distilled water.

4. Continue with steps 6 - 10 from above.

Test Results

1. Remove the trays from the incubator after 24 hours incubation. Samples must be removed from the incubator with 28 hours. Because the sample is divided into 97 portions, some of the wells are slower to develop the color change. Therefore it is preferable the let the trays incubate 27-28 hours.

2 Examine each well on the tray for the presence of a yellow color (confirming the presence of coliform bacteria) that is equal to or greater than the compartor. Wells that are slightly yellow, but not as yellow as the comparator, must be place back into the incubator to incubate for the full 28 hours. Samples left in the incubator for more than 28 hours must be reported as "Laboratory Accident" unless they are clear.

3. Count the number of large wells (including the very large well at the top of the tray) and the number of small wells that have a yellow color equal to or greater than the comparator and record in the "CONF/COLI" column on the "Colilert Bench Sheet" (Attachment #1) as follows: # Large Wells/# Small Wells * Dilution Factor.

4. All trays that contain at least one yellow well (Total Coliform Positive Samples) must be taken into the Walk-In Incubator and checked for fluorescence with the 366 nm UV light. Wells with fluoresce equal to or greater than the comparator are

Positive for *E. coli* and must be marked with a marker.

5. Count the number of large wells and the number of small wells that fluoresces equal to or greater than the comparator and record in the "EC/FC24" column on the "Colilert Bench Sheet" (Attachment #1) as follows: # Large Wells/# Small Wells * Dilution Factor.

6. Using the IDEXX Quanti-Tray/2000 MPN Table (Attachment #2) determine the number of total coliforms and *E. coli* as follows:

   For total coliforms - read down the chart for the number of large yellow wells and across the top for the number of small yellow wells. The point where the column and row intersect is the MPN value for total coliforms based on 100 mL of sample. If a 10^{-1} dilution of the original sample was made the MPN value must be multiplied by 10. If a 10^{-2} dilution of the original sample was made the MPN value must be multiplied by 100.

   For *E. coli* - read down the chart for the number of large fluorescing wells and across the top for the number of small fluorescing wells. The point where the column and row intersect is the MPN value for total coliforms based on 100 mL of sample. If a 10^{-1} dilution of the original sample was made the MPN value must be multiplied by 10. If a 10^{-2} dilution of the original sample was made the MPN value must be multiplied by 100.

   If all wells are clear (Negative for Total Coliforms) then record as "0/0 * Dilution Factor" in the "CONF/COLI" column on the "Colilert Bench Sheet" and report as < minimum detection limit in the "TOTAL" column. Minimum Detection Limits are as follows: < 1 for 100 mL portions, < 10 for 10^{-1} dilutions and < 100 for 10^{-2} dilutions.

7. Record the date reported in the "RPT DATE" column and the initials of the analysts reading the results in the "INT." column. Also, record the time the samples are read in the space to the right of the last column.

   Note: The report date, analysts initials and time read may be recorded on the top line and then arrows drawn down. See example on Attachment #1.

8. After the data has been entered on the bench sheet for a particular sample then the Water Bacteriological Report Form (EM-1) is to be completed. Total Coliforms are to be marked as "Present" or "Absent". *E. coli* only has to be marked as

"Present" or "Absent" if Total Coliforms are Present. The MPN value for total coliforms and *E. coli* is to then be recorded in the "_____ per 100 mL" space.

8. After all EM-1 forms are marked, they are to be placed in the basket labeled "Forms To Be Checked".

9. All forms are to be checked by a Microbiologist II or higher. All samples with Total Coliform Positive Results must be initialed by the analyst checking them on the bench sheet. Initials are to be placed to the right of the initials of the analyst reading the test. (See Attachment #1).

VI. Quality Control

See procedure Chromogenic/Fluorogenic Substrate Test (Colilert 100 mL), Section VI.

Additional Quality Control for the Quanti Tray:

1. On a monthly basis, add 100 mL of a bromcresol purlple solution to a 97 well tray and seal. Check for any leaks and record the results on the "Quanti Tray Sealer - Leak Check" form (Attachment #3)

Attachment #1
Colilert Bench Sheet

coluert

3/14/00

lab #	code	cty	col date	recd date	anal date	name	collector	sampling poin	conf/co	ecoli da	total	ecoli r	rpt date	init
13499	3A	LOGAN	3/13/00	3/13/00	3/14/00	HOLLY BROTH	DESKINS	NEW MAN US					3/15/00	DC
13500	3A	LOGAN	3/13/00	3/13/00	3/14/00	HOLLY BROTH	DESKINS	NEW MAIN US						
13501	3A	LOGAN	3/13/00	3/13/00	3/14/00	HOLLY BROTH	DESKINS	AREA 4 NEW						
13502	3A	LOGAN	3/13/00	3/13/00	3/14/00	HOLLY BROTH	DESKINS	AREA 4 NEW						
13503	3A	LOGAN	3/13/00	3/13/00	3/14/00	HOLLY BROTH	DESKINS	AREA 4 NEW						
13504	3B	KANAW	3/13/00	3/13/00	3/14/00	CAROLYN MIL	HANNA	KIT SINK						
13576	3A	RANDOL	3/13/00	3/14/00	3/14/00	ELEANOR F M	MAILLOUX	KIT						
13577	3A	MERCE	3/13/00	3/14/00	3/14/00	PEIDMONT CO	MARTIN	C MARTIN KI						
13578	3A	FAYETT	3/13/00	3/14/00	3/14/00	NELLIE WILLI	SALE	MH #3 KIT SI	+1	+1	P	P		
13579	3B	GREENB	3/13/00	3/14/00	3/14/00	JASON BOOTH	ELTZROTH	KIT TAP						
13580	3B	TYLER	3/13/00	3/14/00	3/14/00	PAT ORDILE	ORDILE	KIT SINK						
13581	3B	JACKSO	3/13/00	3/14/00	3/14/00	HELEN FLETC	SAUNDERS	KIT SINK	+1	-1	P	A		
13582	3B	WETZEL	3/13/00	3/14/00	3/14/00	JOHN P BUCH	BUCHER	FAUCET						
13583	3B	MINGO	3/13/00	3/14/00	3/14/00	LEON BLACKB	SALMONS	KIT SINK	+1	-1	P	A		
13584	3B	CALHOU	3/13/00	3/14/00	3/14/00	LEON STUMP	BLOSS	KIT SINK	+1	-1	P	A		
13585	3B	WAYNE	3/13/00	3/14/00	3/14/00	HAROLD SHEP	WHALEY	KIT SINK						
13586	3A	NICHOL	3/13/00	3/14/00	3/14/00	BILL HARRIS	SPARKS	ND						
13587	3B	WETZEL	3/13/00	3/14/00	3/14/00	THEODORE B	BUTLER	KIT SINK	+1	-1	P	A		
13588	3B	MCDOW	3/13/00	3/14/00	3/14/00	ALLEN CLICK	THURMER	KIT SINK	+1	-1	P	A		
13589	3B	GREENB	3/13/00	3/14/00	3/14/00	JAME H ROWE	ELTZROTH	KIT SINK						
13590	3B	GREENB	3/13/00	3/14/00	3/14/00	JOYCE PARKE	ELTZROTH	KIT SINK						
13591	3B	GREENB	3/13/00	3/14/00	3/14/00	DARRELL OCH	ELTZROTH	RR TAP						
13592	3B	GREENB	3/13/00	3/14/00	3/14/00	ALFRED FRAN	ELTZROTH	KIT SINK	+1	+1	P	P		
13593	3B	GREENB	3/13/00	3/14/00	3/14/00	HAROLD FRAN	ELTZROTH	KIT SINK	+1	-1	P	A		
13594	3C	LEWIS	3/14/00	3/14/00	3/14/00	WILLIAM CHIL	FREDERIC	KIT SINK						
13595	3D	SUMME	3/13/00	3/14/00	3/14/00	PIPESTEM PA	TRAIL	SHALLOW						
13596	3D	SUMME	3/13/00	3/14/00	3/14/00	PIPESTEM PA	TRAIL	DEEP						
13597	3M	ROANE	3/13/00	3/14/00	3/14/00	ARTHUR A LO	HARRIS	KIT SINK						
13598	3F	KANAW	3/13/00	3/14/00	3/14/00	UNITED VALLE	PAULEY	GAL JUG COD						
13600	3B	WETZEL	3/13/00	3/14/00	3/14/00	PHILLIP BROW	BROWN	PORTERS FA						
13601	3B	WETZEL	3/13/00	3/14/00	3/14/00	PHILLIP BROW	BROWN	FURBEE RID	+1	-1	P	A		
13602	8I	FAYETT	3/13/00	3/14/00	3/14/00	KANAWHA FAL	KIRBY	SPRING	30/2 (10x)	0/0	237	<10		
13603	8J	HANCO	3/13/00	3/14/00	3/14/00	MOUNTAINEE	DAVENPO	BACK UP WE	0/0 (1x)	0/0	<1.0	<1.0		
13604	8J	HANCO	3/13/00	3/14/00	3/14/00	MOUNTAINEE	DAVENPO	PRIMARY WE	0/3 (1x)	0/0	3.0	<1.0		
13605	8G	GREENB	3/13/00	3/14/00	3/14/00	DEAN DAVIS D	JONES	MILKHOUSE	0/0 (1x)	0/0	<1.0	<1.0		
13607	3A	UPSHUR	3/13/00	3/14/00	3/14/00	ADRAIN PSD	ANDERSO	FRENCH CRE						
13608	3A	UPSHUR	3/13/00	3/14/00	3/14/00	ADRAIN PSD	ANDERSO	CARTER PUM						
13613	3A	HANCO	3/13/00	3/14/00	3/14/00	NEW CUMBER	SEES	REST						
13614	3A	MCDOW	3/13/00	3/14/00	3/14/00	H C LEWIS OIL	COOLEY	RR SINK						
13615	8J	HANCO	3/13/00	3/14/00	3/14/00	NEW CUMBER	SEES	WELL TAP	0/0 (1x)	0/0	<1.0	<1.0		

Page 1

Attachment #2

IDEXX Quanti-Tray/2000 MPN Table

IDEXX Quanti-Tray/2000 MPN Table

\# Small Wells Positive

# Large Wells Positive	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.1	16.1	17.1	18.1	19.1	20.2	21.2	22.2	23.3	24.3
1	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.1	9.1	10.1	11.1	12.1	13.2	14.2	15.2	16.2	17.3	18.3	19.3	20.4	21.4	22.4	23.5	24.5	25.6
2	2.0	3.0	4.1	5.1	6.1	7.1	8.1	9.2	10.2	11.2	12.2	13.3	14.3	15.3	16.4	17.4	18.5	19.5	20.6	21.6	22.6	23.7	24.8	25.8	26.9
3	3.1	4.1	5.1	6.1	7.2	8.2	9.2	10.3	11.3	12.4	13.4	14.4	15.5	16.5	17.6	18.6	19.7	20.8	21.8	22.9	23.9	25.0	26.1	27.1	28.2
4	4.1	5.2	6.2	7.2	8.3	9.3	10.4	11.4	12.5	13.5	14.6	15.6	16.7	17.8	18.8	19.9	21.0	22.0	23.1	24.2	25.3	26.3	27.4	28.5	29.6
5	5.2	6.3	7.3	8.4	9.4	10.5	11.5	12.6	13.7	14.7	15.8	16.9	17.9	19.0	20.1	21.2	22.2	23.3	24.4	25.5	26.6	27.7	28.8	29.9	31.0
6	6.3	7.4	8.4	9.5	10.6	11.6	12.7	13.8	14.9	15.9	17.0	18.1	19.2	20.3	21.4	22.5	23.6	24.7	25.8	26.9	28.0	29.1	30.2	31.3	32.4
7	7.4	8.5	9.6	10.7	11.8	12.8	13.9	15.0	16.1	17.2	18.3	19.4	20.5	21.6	22.7	23.8	24.9	26.0	27.1	28.3	29.4	30.5	31.6	32.8	33.9
8	8.6	9.7	10.8	11.9	13.0	14.1	15.2	16.3	17.4	18.5	19.6	20.7	21.8	22.9	24.1	25.2	26.3	27.4	28.6	29.7	30.8	32.0	33.1	34.3	35.4
9	9.8	10.9	12.0	13.1	14.2	15.3	16.4	17.6	18.7	19.8	20.9	22.0	23.2	24.3	25.4	26.6	27.7	28.9	30.0	31.2	32.3	33.5	34.6	35.8	37.0
10	11.0	12.1	13.2	14.3	15.5	16.6	17.7	18.9	20.0	21.1	22.3	23.4	24.6	25.7	26.9	28.0	29.2	30.3	31.5	32.7	33.8	35.0	36.2	37.4	38.6
11	12.2	13.4	14.5	15.6	16.8	17.9	19.1	20.2	21.4	22.5	23.7	24.8	26.0	27.2	28.3	29.5	30.7	31.9	33.0	34.2	35.4	36.6	37.8	39.0	40.2
12	13.5	14.6	15.8	16.9	18.1	19.3	20.4	21.6	22.8	23.9	25.1	26.3	27.5	28.6	29.8	31.0	32.2	33.4	34.6	35.8	37.0	38.2	39.5	40.7	41.9
13	14.8	16.0	17.1	18.3	19.5	20.6	21.8	23.0	24.2	25.4	26.6	27.8	29.0	30.2	31.4	32.6	33.8	35.0	36.2	37.5	38.7	39.9	41.1	42.4	43.6
14	16.1	17.3	18.5	19.7	20.9	22.1	23.3	24.5	25.7	26.9	28.1	29.3	30.5	31.7	33.0	34.2	35.4	36.7	37.9	39.1	40.4	41.6	42.9	44.2	45.4
15	17.5	18.7	19.9	21.1	22.3	23.5	24.7	25.9	27.2	28.4	29.6	30.9	32.1	33.3	34.6	35.8	37.1	38.4	39.6	40.9	42.2	43.4	44.7	46.0	47.3
16	18.9	20.1	21.3	22.6	23.8	25.0	26.3	27.5	28.7	30.0	31.2	32.5	33.7	35.0	36.3	37.5	38.8	40.1	41.4	42.7	44.0	45.3	46.6	47.9	49.2
17	20.3	21.6	22.8	24.0	25.3	26.5	27.8	29.1	30.3	31.6	32.9	34.1	35.4	36.7	38.0	39.3	40.6	41.9	43.2	44.5	45.9	47.2	48.5	49.8	51.2
18	21.8	23.1	24.3	25.6	26.9	28.1	29.4	30.7	32.0	33.3	34.6	35.9	37.2	38.5	39.8	41.1	42.4	43.8	45.1	46.4	47.8	49.1	50.5	51.9	53.2
19	23.3	24.6	25.9	27.2	28.5	29.8	31.1	32.4	33.7	35.0	36.3	37.6	39.0	40.3	41.6	43.0	44.3	45.7	47.1	48.4	49.8	51.2	52.6	54.0	55.4
20	24.9	26.2	27.5	28.8	30.1	31.4	32.8	34.1	35.4	36.8	38.1	39.5	40.8	42.2	43.6	44.9	46.3	47.7	49.1	50.5	51.9	53.3	54.7	56.1	57.6
21	26.5	27.9	29.2	30.5	31.9	33.2	34.6	35.9	37.3	38.7	40.0	41.4	42.8	44.1	45.5	46.9	48.4	49.8	51.2	52.6	54.1	55.5	57.0	58.5	59.9
22	28.2	29.5	30.9	32.3	33.6	35.0	36.4	37.7	39.1	40.5	41.9	43.3	44.7	46.2	47.6	49.0	50.5	51.9	53.4	54.8	56.3	57.8	59.3	60.7	62.2
23	29.9	31.3	32.7	34.1	35.4	36.8	38.2	39.7	41.1	42.5	43.9	45.4	46.8	48.3	49.7	51.2	52.7	54.2	55.6	57.1	58.6	60.2	61.7	63.2	64.7
24	31.7	33.1	34.5	35.9	37.3	38.8	40.2	41.6	43.1	44.6	46.0	47.5	49.0	50.5	52.0	53.4	55.0	56.5	58.0	59.5	61.1	62.6	64.2	65.8	67.3
25	33.5	35.0	36.4	37.9	39.3	40.8	42.2	43.7	45.2	46.7	48.2	49.7	51.2	52.7	54.3	55.8	57.3	58.9	60.5	62.0	63.6	65.2	66.8	68.4	70.0
26	35.5	36.9	38.4	39.9	41.3	42.8	44.3	45.9	47.4	48.9	50.4	52.0	53.5	55.1	56.7	58.2	59.8	61.4	63.0	64.7	66.3	67.9	69.6	71.2	72.8
27	37.4	38.9	40.4	41.9	43.5	45.0	46.5	48.1	49.6	51.2	52.8	54.4	56.0	57.6	59.2	60.8	62.4	64.1	65.7	67.4	69.1	70.8	72.5	74.2	75.9
28	39.5	41.0	42.6	44.1	45.7	47.2	48.8	50.4	52.0	53.6	55.2	56.8	58.5	60.1	61.8	63.5	65.2	66.9	68.6	70.3	72.0	73.7	75.5	77.3	79.0
29	41.6	43.2	44.8	46.4	48.0	49.6	51.2	52.8	54.5	56.1	57.8	59.5	61.2	62.9	64.6	66.3	68.0	69.8	71.5	73.3	75.1	76.9	78.7	80.5	82.3
30	43.8	45.5	47.1	48.7	50.4	52.0	53.7	55.4	57.1	58.8	60.5	62.2	64.0	65.7	67.5	69.3	71.0	72.8	74.7	76.5	78.3	80.2	82.1	84.0	85.9
31	46.2	47.9	49.5	51.2	52.9	54.6	56.3	58.1	59.8	61.6	63.3	65.1	66.9	68.7	70.5	72.4	74.2	76.1	78.0	79.9	81.8	83.7	85.7	87.6	89.6
32	48.7	50.4	52.1	53.8	55.6	57.3	59.1	60.9	62.7	64.5	66.3	68.1	70.0	71.9	73.8	75.7	77.6	79.5	81.5	83.5	85.4	87.5	89.5	91.5	93.6
33	51.2	53.0	54.7	56.5	58.3	60.1	62.0	63.8	65.7	67.6	69.5	71.4	73.3	75.2	77.2	79.2	81.2	83.2	85.2	87.3	89.3	91.4	93.6	95.7	97.8
34	53.9	55.7	57.6	59.4	61.3	63.1	65.0	66.9	68.9	70.8	72.8	74.8	76.8	78.8	80.8	82.9	85.0	87.1	89.2	91.4	93.6	95.8	98.0	100.2	102.4
35	56.8	58.6	60.5	62.4	64.4	66.3	68.3	70.3	72.3	74.3	76.3	78.4	80.5	82.6	84.7	86.9	89.1	91.3	93.5	95.7	98.0	100.3	102.6	105.0	107.3
36	59.8	61.7	63.7	65.7	67.7	69.7	71.7	73.8	75.9	78.0	80.1	82.3	84.5	86.7	88.9	91.2	93.5	95.8	98.1	100.5	102.9	105.3	107.7	110.2	112.7
37	62.9	65.0	67.0	69.1	71.2	73.3	75.4	77.6	79.8	82.0	84.2	86.5	88.8	91.1	93.4	95.8	98.2	100.6	103.1	105.6	108.1	110.7	113.3	115.9	118.6
38	66.3	68.4	70.6	72.7	74.9	77.1	79.4	81.6	83.9	86.2	88.6	91.0	93.4	95.8	98.3	100.8	103.4	105.9	108.6	111.2	113.9	116.6	119.4	122.2	125.0
39	70.0	72.2	74.4	76.7	78.9	81.3	83.6	86.0	88.4	90.9	93.4	95.9	98.4	101.0	103.6	106.3	109.0	111.8	114.6	117.4	120.3	123.2	126.1	129.2	132.2
40	73.8	76.2	78.5	80.9	83.3	85.7	88.2	90.7	93.3	95.9	98.5	101.2	103.9	106.7	109.5	112.4	115.3	118.2	121.2	124.3	127.4	130.5	133.7	137.0	140.3
41	78.0	80.5	83.0	85.5	88.0	90.6	93.3	95.9	98.7	101.4	104.3	107.1	110.0	113.0	116.0	119.1	122.2	125.4	128.7	132.0	135.4	138.8	142.3	145.9	149.5
42	82.6	85.2	87.8	90.5	93.2	96.0	98.8	101.7	104.6	107.6	110.6	113.7	116.9	120.1	123.4	126.7	130.1	133.6	137.2	140.8	144.5	148.3	152.2	156.1	160.2
43	87.6	90.4	93.2	96.0	99.0	101.9	105.0	108.1	111.2	114.5	117.8	121.1	124.6	128.1	131.7	135.4	139.1	143.0	147.0	151.0	155.2	159.4	163.8	168.2	172.8
44	93.1	96.1	99.1	102.2	105.4	108.6	111.9	115.3	118.7	122.3	125.9	129.6	133.4	137.4	141.4	145.5	149.7	154.1	158.5	163.1	167.8	172.7	177.7	182.9	188.2
45	99.3	102.5	105.8	109.2	112.6	116.2	119.8	123.6	127.4	131.4	135.4	139.6	143.9	148.3	152.9	157.6	162.4	167.4	172.6	178.0	183.5	189.2	195.1	201.2	207.5
46	106.3	109.8	113.4	117.2	121.0	125.0	129.1	133.3	137.6	142.1	146.7	151.5	156.5	161.6	166.9	172.5	178.2	184.2	190.4	196.8	203.5	210.5	217.8	225.4	233.3
47	114.3	118.3	122.4	126.6	130.9	135.4	140.1	145.0	150.0	155.3	160.7	166.4	172.3	178.5	185.0	191.8	198.9	206.3	214.2	222.4	231.0	240.0	249.5	259.5	270.0
48	123.9	128.4	133.1	137.9	143.0	148.3	153.9	159.7	165.8	172.2	178.9	186.0	193.5	201.4	209.8	218.7	228.2	238.2	248.9	260.2	272.3	285.1	298.7	313.0	328.2
49	135.5	140.8	146.4	152.3	158.5	165.0	172.0	179.3	187.2	195.6	204.6	214.3	224.7	235.9	248.1	261.3	275.5	290.9	307.6	325.5	344.8	365.4	387.3	410.6	435.2

IDEXX Quanti-Tray/2000 MPN Table

\# Small Wells Positive

# Large Wells Positive	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
0	25.3	26.3	27.4	28.4	29.5	30.5	31.5	32.6	33.6	34.7	35.7	36.8	37.8	38.9	39.9	41.0	42.1	43.1	44.2	45.3	46.3	47.4	48.5	49.5
1	26.6	27.6	28.7	29.7	30.8	31.9	32.9	34.0	35.0	36.1	37.2	38.2	39.3	40.4	41.4	42.5	43.6	44.7	45.7	46.8	47.9	49.0	50.1	51.2
2	27.9	29.0	30.0	31.1	32.2	33.2	34.3	35.4	36.5	37.5	38.6	39.7	40.8	41.9	43.0	44.0	45.1	46.2	47.3	48.4	49.5	50.6	51.7	52.8
3	29.3	30.3	31.4	32.5	33.6	34.7	35.7	36.8	37.9	39.0	40.1	41.2	42.3	43.4	44.5	45.6	46.7	47.8	48.9	50.0	51.2	52.3	53.4	54.5
4	30.7	31.7	32.8	33.9	35.0	36.1	37.2	38.3	39.4	40.5	41.6	42.8	43.9	45.0	46.1	47.2	48.3	49.5	50.6	51.7	52.9	54.0	55.1	56.3
5	32.1	33.2	34.3	35.4	36.5	37.6	38.7	39.9	41.0	42.1	43.2	44.3	45.5	46.6	47.7	48.9	50.0	51.2	52.3	53.5	54.6	55.8	56.9	58.1
6	33.5	34.6	35.8	36.9	38.0	39.1	40.3	41.4	42.6	43.7	44.8	46.0	47.1	48.3	49.4	50.6	51.7	52.9	54.1	55.2	56.4	57.6	58.7	59.9
7	35.0	36.2	37.3	38.4	39.6	40.7	41.9	43.0	44.2	45.3	46.5	47.7	48.8	50.0	51.2	52.3	53.5	54.7	55.9	57.1	58.2	59.4	60.6	61.8
8	36.5	37.7	38.9	40.0	41.2	42.3	43.5	44.7	45.9	47.0	48.2	49.4	50.6	51.8	53.0	54.1	55.3	56.5	57.7	58.9	60.2	61.4	62.6	63.8
9	38.1	39.3	40.5	41.6	42.8	44.0	45.2	46.4	47.6	48.8	50.0	51.2	52.4	53.6	54.8	56.0	57.2	58.4	59.7	60.9	62.1	63.4	64.6	65.8
10	39.7	40.9	42.1	43.3	44.5	45.7	46.9	48.1	49.3	50.6	51.8	53.0	54.2	55.5	56.7	57.9	59.2	60.4	61.7	62.9	64.2	65.4	66.7	67.9
11	41.4	42.6	43.8	45.0	46.3	47.5	48.7	49.9	51.2	52.4	53.7	54.9	56.1	57.4	58.6	59.9	61.2	62.4	63.7	65.0	66.2	67.5	68.8	70.1
12	43.1	44.3	45.6	46.8	48.1	49.3	50.6	51.8	53.1	54.3	55.6	56.8	58.1	59.4	60.7	61.9	63.2	64.5	65.8	67.1	68.4	69.7	71.0	72.3
13	44.9	46.1	47.4	48.6	49.9	51.2	52.4	53.7	55.0	56.3	57.6	58.9	60.2	61.5	62.8	64.1	65.4	66.7	68.0	69.3	70.7	72.0	73.3	74.7
14	46.7	48.0	49.3	50.5	51.8	53.1	54.4	55.7	57.0	58.3	59.6	60.9	62.3	63.6	64.9	66.3	67.6	68.9	70.3	71.6	73.0	74.4	75.7	77.1
15	48.6	49.9	51.2	52.5	53.8	55.1	56.4	57.8	59.1	60.4	61.8	63.1	64.5	65.8	67.2	68.5	69.9	71.3	72.6	74.0	75.4	76.8	78.2	79.6
16	50.5	51.8	53.2	54.5	55.8	57.2	58.5	59.9	61.2	62.6	64.0	65.3	66.7	68.1	69.5	70.9	72.3	73.7	75.1	76.5	77.9	79.3	80.8	82.2
17	52.5	53.9	55.2	56.6	58.0	59.3	60.7	62.1	63.5	64.9	66.3	67.7	69.1	70.5	71.9	73.3	74.8	76.2	77.6	79.1	80.5	82.0	83.5	84.9
18	54.6	56.0	57.4	58.8	60.2	61.6	63.0	64.4	65.8	67.2	68.6	70.1	71.5	73.0	74.4	75.9	77.3	78.8	80.3	81.8	83.3	84.8	86.3	87.8
19	56.8	58.2	59.6	61.0	62.4	63.9	65.3	66.7	68.2	69.7	71.1	72.6	74.1	75.5	77.0	78.5	80.0	81.5	83.1	84.6	86.1	87.6	89.2	90.7
20	59.0	60.4	61.9	63.3	64.8	66.3	67.7	69.2	70.7	72.2	73.7	75.2	76.7	78.2	79.8	81.3	82.8	84.4	85.9	87.5	89.1	90.6	92.2	93.8
21	61.3	62.8	64.3	65.8	67.3	68.8	70.3	71.8	73.3	74.9	76.4	77.9	79.5	81.0	82.6	84.2	85.8	87.4	89.0	90.6	92.2	93.8	95.4	97.1
22	63.7	65.3	66.8	68.3	69.9	71.4	73.0	74.5	76.1	77.7	79.3	80.9	82.4	84.0	85.7	87.3	88.9	90.5	92.1	93.8	95.5	97.1	98.8	100.5
23	66.3	67.8	69.4	71.0	72.5	74.1	75.7	77.3	78.9	80.5	82.1	83.8	85.4	87.1	88.7	90.4	92.1	93.8	95.5	97.2	98.9	100.6	102.3	104.1
24	68.9	70.5	72.1	73.7	75.3	77.0	78.6	80.2	81.9	83.6	85.2	86.9	88.6	90.3	92.0	93.8	95.5	97.2	99.0	100.7	102.5	104.3	106.1	107.9
25	71.7	73.3	75.0	76.6	78.3	80.0	81.6	83.3	85.0	86.8	88.5	90.2	92.0	93.7	95.5	97.3	99.1	100.9	102.7	104.5	106.3	108.2	110.0	111.9
26	74.6	76.3	78.0	79.7	81.4	83.1	84.8	86.6	88.4	90.1	91.9	93.7	95.5	97.3	99.2	101.0	102.9	104.7	106.6	108.5	110.4	112.3	114.2	116.2
27	77.6	79.4	81.1	82.9	84.6	86.4	88.2	90.0	91.9	93.7	95.5	97.4	99.3	101.2	103.1	105.0	106.9	108.8	110.8	112.7	114.7	116.7	118.7	120.7
28	80.9	82.6	84.4	86.3	88.1	89.9	91.8	93.7	95.6	97.5	99.4	101.3	103.3	105.2	107.2	109.2	111.2	113.2	115.2	117.3	119.3	121.4	123.5	125.6
29	84.2	86.1	87.9	89.8	91.7	93.6	95.6	97.5	99.5	101.5	103.5	105.5	107.5	109.5	111.6	113.7	115.7	117.8	120.0	122.1	124.2	126.4	128.6	130.8
30	87.8	89.7	91.7	93.6	95.6	97.6	99.6	101.6	103.7	105.7	107.8	109.9	112.0	114.1	116.3	118.5	120.6	122.8	125.1	127.3	129.6	131.8	134.1	136.4
31	91.6	93.6	95.6	97.7	99.7	101.8	103.9	106.0	108.2	110.3	112.5	114.7	116.9	119.1	121.4	123.6	125.9	128.2	130.6	132.9	135.3	137.7	140.1	142.6
32	95.7	97.7	99.9	102.0	104.2	106.3	108.5	110.7	113.0	115.2	117.5	119.8	122.1	124.5	126.8	129.2	131.6	134.0	136.5	139.0	141.5	144.0	146.6	149.1
33	100.0	102.2	104.4	106.6	108.9	111.2	113.5	115.8	118.2	120.5	122.9	125.3	127.8	130.3	132.8	135.3	137.8	140.4	143.0	145.6	148.3	150.9	153.6	156.4
34	104.7	107.0	109.3	111.7	114.0	116.4	118.9	121.3	123.8	126.3	128.8	131.4	134.0	136.6	139.2	141.9	144.6	147.3	150.1	152.9	155.7	158.6	161.5	164.4
35	109.7	112.2	114.6	117.1	119.6	122.1	124.7	127.3	129.9	132.6	135.3	138.0	140.8	143.6	146.4	149.2	152.1	155.0	158.0	161.0	164.0	167.1	170.2	173.3
36	115.2	117.8	120.4	123.0	125.7	128.4	131.1	133.9	136.7	139.5	142.4	145.3	148.3	151.3	154.3	157.3	160.4	163.6	166.8	170.0	173.3	176.6	179.9	183.3
37	121.3	124.0	126.8	129.6	132.4	135.3	138.2	141.2	144.2	147.2	150.3	153.5	156.6	159.9	163.1	166.4	169.8	173.2	176.7	180.2	183.7	187.3	191.0	194.7
38	127.9	130.8	133.8	136.8	139.9	143.0	146.1	149.3	152.6	155.9	159.2	162.6	166.1	169.6	173.2	176.8	180.4	184.2	188.0	191.8	195.7	199.6	203.7	207.7
39	135.3	138.5	141.7	145.0	148.3	151.7	155.1	158.6	162.1	165.7	169.4	173.1	176.9	180.7	184.7	188.7	192.7	196.8	201.0	205.3	209.6	214.0	218.5	223.0
40	143.7	147.1	150.6	154.2	157.8	161.5	165.3	169.1	173.0	177.0	181.1	185.2	189.4	193.7	198.1	202.5	207.0	211.7	216.4	221.1	226.0	231.0	236.0	241.1
41	153.2	157.0	160.9	164.8	168.9	173.0	177.2	181.4	185.8	190.3	194.8	199.5	204.2	209.1	214.0	219.0	224.2	229.4	234.8	240.2	245.8	251.5	257.2	263.1
42	164.3	168.6	172.9	177.3	181.9	186.5	191.3	196.1	201.1	206.2	211.4	216.7	222.1	227.7	233.4	239.2	245.2	251.3	257.5	263.8	270.3	276.9	283.6	290.5
43	177.5	182.3	187.3	192.4	197.6	202.9	208.4	214.0	219.8	225.8	231.8	238.1	244.5	251.0	257.7	264.6	271.7	278.9	286.3	293.8	301.5	309.4	317.4	325.6
44	193.6	199.3	205.0	211.0	217.2	223.5	230.0	236.7	243.6	250.7	258.1	265.6	273.3	281.2	289.4	297.8	306.3	315.1	324.1	333.3	342.8	352.4	362.3	372.4
45	214.1	220.9	227.9	235.1	242.7	250.4	258.4	266.7	275.3	284.1	293.2	302.6	312.3	322.3	332.5	343.0	353.8	364.9	376.2	387.9	399.8	412.0	424.5	437.4
46	241.5	250.0	258.9	268.2	277.8	287.7	298.1	308.8	319.9	331.4	343.3	355.5	368.1	381.1	394.5	408.3	422.5	437.0	452.0	467.4	483.3	499.6	516.3	533.5
47	280.9	292.4	304.4	316.9	330.0	343.6	357.8	372.5	387.7	403.4	419.8	436.6	454.1	472.1	490.7	509.9	529.8	550.4	571.7	593.8	616.7	640.5	665.3	691.0
48	344.1	360.9	378.4	396.8	416.0	436.0	456.9	478.6	501.2	524.7	549.3	574.8	601.5	629.4	658.6	689.3	721.5	755.6	791.5	829.7	870.4	913.9	960.6	1011.1
49	461.1	488.4	517.2	547.5	579.4	613.1	648.8	686.7	727.0	770.1	816.4	866.4	920.8	980.4	1046.2	1119.9	1203.3	1299.7	1413.6	1553.1	1732.9	1986.3	2419.2	>2419.2

Attachment #3

Quanti-Tray Sealer - Leak Checks

QUANTI-TRAY SEALER

Leak Checks

Date	Sealer	Results/Int.	Date	Sealer	Results/Int.

Multi Tube Fermentation (100 mL)

I. Introduction -

Multi Tube Fermentation is the standard test used by the laboratory for detecting total coliform and fecal coliform bacteria drinking water compliance samples. The historical definition for the coliform group of bacteria has been based on the method used for detection. When using the fermentation test, the coliform group of bacteria is defined as all facultative anaerobic, gram-negative, non-spore-forming, rod-shaped bacteria that ferment lactose with gas and acid formation within 48 hours at 35°C. For drinking water compliance samples the laboratory uses a single 100 mL sample portions and because of the potential problems associated with gas bubbles in large inverted tubes, the gas vials are replaced with bromcresol purple (0.01 g/L). The test consists of two phases - presumptive and confirmation and can take anywhere from 48 to 96 hours for completion.

II. Sample Requirements -

1. Maximum allowable elapsed time between sample collection and sample analysis is thirty (30) hours.

2. Reject samples for any of the following reasons:

   A. Sample exceeds 30 hours.
   B. Information on the Water Bacteriological Report Form (EM-1) is insufficient. (No date or time of collection)
   C. Insufficient Sample Volume. (< 97.5 mL)
   D. Sample contains residual chlorine.
   E. Insufficient air space to facilitate mixing of sample.
   F. Sample container was not furnished by the Office of Laboratory Services.

III. Sample Types -

1. Drinking water compliance samples only.

IV. Reagents and Equipment -

Reagents

1. Lauryl Tryptose Broth (double strength with 0.01 g/L Bromcresol Purple). Prepared by the Media Preparation Section in 250 mL screw cap culture bottles

(Corning or Wheaton) and stored in the dark in the cabinets in the water room for no longer than three months at room temperature (<30°C).

2. Brilliant Green Bile Broth. Prepared by the Media Preparation Section in 20 x 150 mm screw cap culture tubes and stored in the dark in the cabinets in the water room for no longer than three months at room temperature (<30°C).

3. EC Medium. Prepared by the Media Preparation Section in 20 x 150 mm screw cap culture tubes and stored in the dark in the cabinets in the water room for no longer than three months at room temperature.

Equipment

1. 35.0 ± 0.5°C Incubator. (Walk-In or Environette)
2. Sterile Cotton Swabs.
3. Metal Racks and Baskets.
4. Culture Tube Racks.
5. Wax "Chicken" Buckets.
6. Tare Bottle with 100.0 ± 2.5 mL range indicated.

For Quality Control

1. 10^{-8} Stock of E. coli
2. Slant of non-lactose fermentating *E. coli*
3. (3) 100 mL Sterile Water Samples.
4. Inoculating Loops

V. Procedure

Note: All data for the presumptive and confirmation phase is to be recorded on the MTF work sheet (Attachment #1) in the MTF Records Records Book.

Presumptive Phase

1. Shake sample 25 times in 7 seconds with a 1 foot movement and pour off excess so that only 100 ± 2.5 mL remains. (Use tare bottle.)

2. Pour 100 mL of sample into culture bottle containing 100 mL of double strength lauryl tryptose broth containing bromcresol purple.

3. Place inoculated culture bottle(s) into metal rack (holds 30 samples) or metal basket (holds 6-7 samples) and place in a 35.0 ± 0.5°C incubator (Walk-In or Environette) for 48 ± 3 hours on the 24 hour shelf.

4. Check cultures in 24 ± 2 hours. If culture(s) are clear purple (negative) or cloudy purple (Turbid), move to the 48 hour shelf. If culture(s) are yellow (Presumptive Positive), remove from the incubator and obtain the corresponding Water Bacteriological Report Form (EM-1). Record a "+1" in the "p/a24" column. Place the corresponding Water Bacteriological Report Form, EM-1 into the 24 Hour BG box. The sample is now ready for the Confirmation Phase.

5. After 48 ± 3 hours of incubation, remove remaining cultures from the incubator. Cultures that are clear purple are negative for total coliform bacteria. For the negative cultures, record the date they are read in the "rpt date" column and the analysts initial's in the "init" column. Also, record the time read out to the side of the last column. Note, the report date and initials can be recorded in the top of the column and lines drawn down. The sample is now ready for reporting.

   If a culture is cloudy purple (turbid), set it aside, locate the corresponding EM-1 form and place it in the 24 Hour BG box and record a "T" in the "P/A48" column. The sample is now ready for the Confirmation Phase.

   If a culture is yellow, set it aside, locate the corresponding EM-1 form and place it in the 24 Hour BG box and record a "+1" in the "P/A48" column. The sample is now ready for the Confirmation Phase.

   Confirmation Phase

6. For each presumptive positive sample (yellow and turbid cultures) submitted for the Confirmation Phase, obtain one tube containing EC Medium (EC) and one tube containing Brilliant Green Bile Broth (BG). Label each tube with the laboratory number as follows: using a wax pencil, label the glass BG tube with the sample number and label metal lid of the EC tube with the laboratory number. (The lid of the EC tube is numbered because the tube is placed in a water bath and if the glass tube is numbered, it may wash off.)

7. Mix the presumptive positive culture by swirling it. Using a sterile swab, dip into the presumptive positive culture and then transfer into EC and then into BG (in that order). Record the time of the transfer in sample log book at the bottom of the appropriate column (p/a24 or P/A48).

8. Place the BG tube on the 24 Hour BG shelf in the 35.0 ± 0.5°C Walk-In Incubator and place the EC tube in the 44.5 ± 0.2°C Fecal Water Bath.

9. After 24 ± 2 hours remove the EC tubes from the Fecal Water Bath and gently swirl to dislodge any gas bubbles. Gas in the inverted gas vial is considered a fecal coliform positive and is to be recored as a "+1" in the "fc data" column. Clear tubes with no gas and turbid tubes with no gas are considered negative for fecal coliform and are to be recorded as "-1" in the "fc data" column. Fecal coliform positive samples are to recorded as "Pres" in the "fecal rp" column.

10. After 24 ± 2 hours the BG tubes are to be removed from the 24 Hour BG shelf and examined for gas production. If there is no gas in the inverted vial, record as "-1" in the "conf/c" column and place back into the Walk-In Incubator on the 48 Hour BG shelf for another 24 hours (total time in BG is 48 ± 3 hours). Place corresponding EM-1 form into the 48 Hour BG Box.

    If there is gas in the inverted gas vial then the sample is confirmed as total coliform positive. Record a "+1" in the "conf/c" column and "Pres" in the "total" column. Record the report date in the "rpt date" column and analysts initials in the "init" column. Also, record the time to the right of the "init" column. The sample is now ready for reporting.

11. After 48 ± 3 hours, remove all BG tubes from the Walk-In and examine for gas production. If there is gas in the inverted gas vial, then the sample is confirmed as total coliform positive. Record a "+1" in the "conf/48" column and "Pres" in the "total" column. Record the report date in the "rpt date" column and analysts initials in the "init" column. Also, record the time to the right of the "init" column. The sample is now ready for reporting.

    If there is no gas in the inverted gas vial, then the sample is considered Invalid. record a "-1" in the "conf/c" column and "Inv" in the "total" column. Record the report date in the "rpt date" column and analysts initials in the "init" column. Also, record the time to the right of the "init" column. The sample is now ready for reporting.

Reporting

12. After analysis is complete and the data is recorded in the log book, the corresponding EM-1 forms must be completed. For samples that are negative for

total coliform, record an "X" in the in the "Total Coliform Absent" Box on the EM-1 form.

For samples that are total coliform positive, record and "X" in the "Total Coliform Present" Box on the EM-1 form. Then record the fecal coliform results by placing an "X" in the appropriate "Fecal Coliform" Box (either Present or Absent). If a sample is "Present" for total coliform, then there must be a result for fecal coliform.

For invalid samples, those that did not produce gas within 48 ± 3 hours in Brilliant Green Bile broth, place an "X" in the "Invalid" box, an "X" in the "Turbid" box and an "X" by the "Send Replacement Sample"

13. After all EM-1 forms are marked, they are to be placed in the "To Be Checked" Basket.

14. A Microbiologist II or higher then will check the EM-1 forms against the log book for precision and accuracy and will initial all total coliform positive results in the log book to the right of the last column.

15. If a sample is submitted for compliance with the Safe Drinking Water Act (SDWA) and is positive for total coliforms, the EM-1 form is pulled by the analyst checking the forms and marked with a "post-it"note indicating that it is to be faxed to the Office of Environmental Health Services - Environmental Engineering Division. These forms are immediately faxed by the staff of the General Reporting Office.

16. All EM-1 forms are then taken to the General Reporting Office where they are sorted, faxed, mailed and stored.

VI. Quality Control

Each batch of laboratory prepared media must be checked before use with positive and negative controls.

1. When media is delivered from the Media & Glassware Preparation Unit, pull 4 samples from each batch (double strength lauryl tryptose broth, brilliant green bile broth and EC Medium).

2. Label as follows: 1 bottle/tube "-" (Negative Control), 1 bottle/tube "NLF" (non-

lactose fermenting E. coli) and 2 bottles/tubes "+" (Positive Control - *E. coli*).

For 100 mL Double Strength Lauryl Tryptose Broth:

3. Obtain four 99 mL dilution blanks per batch. Label as in Step #2. Add nothing to the "-" dilution blank, add one loopful of NLF (from a slant) to the dilution blank labeled "NLF" and add 0.5 mL of 10^{-8} stock of *E. coli* to each dilution blank labeled "+".

4. Shake each dilution blank and add to the appropriate labeled culture bottle and incubate as outlined in the procedure above above.

5. Record Results on QC Form (Attechment #2).

For Brilliant Green Bile Broth and EC Medium:

6. Add 0.5 mL of 10-8 stock culture of E. coli to tubes labeled "+", add a loopful of non-lactose fermentating *E. coli* to the tube labeled "NLF" and add nothing to the tube labeled "-".

7. Incubate as outlined in the procedure in Section V above.

8. Record results on QC Form (Attachment #2).

Attachment #1
MTF Bench Sheet

Attachment #2
Media Productivity and Sterility Checks

Heterotrophic Plate Count (HPC)

I. Introduction -

The Heterotrophic Plate Count, formerly known as Standard Plate Count, is a method for enumerating heterotrophic bacteria in water samples. There are three (3) different methods for the Heterotrophic Plate Count: Pour Plate Method, Spread Plate Method and the Membrane Filter Method. The method that is used by the Environmental Microbiology Unit and the one described below is the Pour Plate Method. Bacterial colonies that are counted can arise from pairs, chains, clusters or single cells which are termed "Colony Forming Units (CFU's). This method can be used as an alternate method to Membrane Filtration and Multi Tube Fermentation when invalidation becomes a problem. Heterotrophic Plate Counts of >500 CFU's/mL are considered "Coliform Positive".

II. Sample Requirements -

1. For Compliance Samples: Maximum allowable elapsed time between sample collection and sample analysis is eight (8) hours with a maximum transit time of six (6) hours and two (2) hours maximum processing time. If sample analysis cannot be analyzed within the eight (8) hours, then they may be refrigerated at < 4.0°C (Do Not Freeze) if examined within 24 hours.

   For Non-Compliance: Begin analysis within 48 hours of collection.

2. Reject samples for any of the following reasons:

   A. Insufficient air space to facilitate mixing of sample.
   B. Sample contains residual chlorine.
   C. Sample exceeds maximum allowable time requirements.
   D. Information on the Water Bacteriological Report Form (EM-1) is insufficient. (No date or time of collection)
   E. Sample container was not furnished by the Office of Laboratory Services

III. Sample Types -

Samples analyzed by this method are done so by special request only. Such requests must include notifying the laboratory in advance of laboratory sample accession.

Certain Bottled Water Companies request a Heterotrophic Plate Count in addition to their coliform test as a part of their Quality Control. These samples are considered Non-Compliance.

IV. Reagents and Equipment -

Reagents

1. Standard Methods Agar (also known as Plate Count Agar). Prepared by the Media Preparation Section and stored in 500 mL screw cap Erlenmeyer flasks (250 mL per flask) in the Media Preparation Refrigerator.

2. 99.0 ± 2.0 mL Buffered Dilution Blanks. Prepared by the Media Preparation Section and stored in the Milk Room wall mounted cabinets. (Are used to accommodate dilutions higher than 0.1 mL)

Equipment

1. Level Table with adequate Lighting (> 50 foot-candles)
2. Flowing Steam Chamber or Boiling Water Bath (to melt the media)
3. Circulating Water Bath (45.0 ± 1.0°C)
4. 1.1 mL Pipets
5. Pipet Bulbs
6. Petri Dishes (15 X 100 mm)
7. Incubator (35.0 ± 0.5°C)
8. Partial Immersion Thermometer calibrated in the 44.0 to 46.0°C range
9. Darkfield Colony Counter
10. Hand Tally (for counting colonies)
11. Wax Pencil (for labeling plates)
12. 70% EtOH Cloths (cheese cloth dampened with 70% EtOH)

V. Procedure -

Set Up and Plating

Note: If HPCs are done on days that there are milk samples, then all of the control work is carried out by the Milk Room Personnel, only the HPC Plates will have to be labeled. If the samples requiring HPCs will also require a Coliform Test, then aseptically transfer 100 mL to the appropriate test vessel for the Coliform Test and

take the remaining sample to the Milk Room for plating.

1. Turn on the Standard Methods Agar (SMA) water bath and circulator and set to 45.0 ± 1.0°C. (Bath should be allowed at least one (1) hour to reach temperature.)

2. Calculate the amount of SMA Media needed as follows:

   A. Determine number of plates needed. There will be four plates per sample (1.0 mL and 0.1 mL in duplicate) plus two (1) plate for an air quality control (labeled "T-1") plus one (1) plate for the pipet sterility control plus one (1) plate for a water blank and one (1) plate for a positive control (0.5 mL from the "10^{-8}" dilution of E. coli)[Positive Control is optional].

   B. (Number of Plates X 15 mL agar per plate) ÷ 250 mL agar per flask = Number of Flasks Required [Round up to the next whole number and add two (2).

3. Obtain the required amount of SMA Media from the Media Preparation Section's Walk-In Refrigerator. Loosen the flask's lids and place them in the Flowing Steam Chamber. Turn on Steam Chamber and set a timer for 45 minutes.

4. When SMA Media is melted, remove from the Flowing Steam Chamber using heat resistant gloves, turn off Steam Chamber and place the media in the Tempering Bath (Step 1). Be sure the temperature of the Tempering Bath is 45.0 ± 1.0°C, adjust if necessary. Replace the cap of the temperature control flask with foil and using a pen or pencil, make a whole large enough to insert a thermometer. Place a thermometer calibrated in the 44.0 - 46.0°C range into the temperature control flask. Be sure that when placing the media in the bath that the water level in the bath rises slightly above the surface of the media in the flask. (Tempering the media may take up to an hour.)

5. Prepare the plating table as follows:

   A. Wipe the table with 70% EtOH.
   B. Obtain a discard bucket from the corner cabinet below and just to the left of the SMA Tempering Bath.
   C. Obtain 1.1 mL pipets and pipet bulb.
   D. Label plates with wax pencil on the lids, not the bottoms - each sample has four (4) plates (unless higher than 0.1 mL dilutions are to be performed):

1) Sample #, A, Dilution 1 (1.0 mL), Date
2) Sample #, A, Dilution 2 (0.1 mL), Date
3) Sample #, B, Dilution 1 (1.0 mL), Date
4) Sample #, B, Dilution 2 (0.1 mL), Date

Plus the following Quality Control Plates:

1) Two (2) Air Quality Plates labeled "T-1" and "T-L"
2) One (1) plate labeled "H_2O"
3) One (1) plate labeled "Pipet"
4) [Optional] One (1) plate labeled "SMA +"(On this plate, also include the "Name of the organism", "Volume Plated", "Date Plated" and the "Date the Agar Was Made"

6. Analysis may begin once the SMA Agar has reached the appropriate temperature (45.0 ± 1.0°C) and the temperature has been recorded on the work sheet. Pour 10 - 12 mL of SMA Agar into a plate labeled "T-1 ". Be sure that the agar covers the bottom of the plate. Place the "T-1" Plate in the middle of the plating area. Expose the plate to the air by removing lid and placing it beside the plate. Do not invert the lid (this would double the surface area exposed to the air). Set a timer for 15 minutes. Proceed with the next Step. When the timer goes off, place the lid on the plate, invert it and place it in the 35.0 ± 0.5°C incubator (the Environette). (Control plates must be kept with the sample plates unless, milk samples are also plated, in which case the control plates are kept with the milk samples)

7. Shake sample vigorously (25 times, within seven (7) seconds, with a one (1) foot movement)

8. With an alcohol cloth (cheese cloth with 70% EtOH), remove the sample bottle lid. Place the lid upside down in the cheese cloth on the table.

9. Remove the pipet from the pipet container (plastic bag or metal canister) without dragging the pipet tip across the exposed ends of the other pipets.

10. Insert the pipet no more than one (1) inch below the surface of the sample and draw the sample up above the 1.1 mL mark.

11. With the pipet at a 45° angle and the lower side of the pipet tip in contact with the neck of the sample container, adjust the sample volume in the pipet down to the

1.1 mL mark.

12. Lift the lid of the petri dish (start with the petri dish with the highest dilution volume - in most cases 0.1 mL) up and slightly to the side. (Just enough to allow insertion of the pipet)

13. With the pipet at a 45°angle and the lower side of the pipet tip in contact with the bottom of the petri dish, deliver 0.1 mL of sample and replace the lid to the plate.

14. Lift the lid of the petri dish with the next lowest dilution (in most cases the 1.0 mL petri dish) just as in Step 12.

15. With the pipet at a 45°angle and the lower side of the pipet in contact with the bottom of the petri dish, deliver 1.0 mL of sample to the petri dish with a column drain of two (2) to four (4) seconds. Touch pipet off in a dry spot on the bottom of the petri dish (pipet at a 90° angle with respect to the bottom of the petri dish) and replace the lid.

16. Repeat Steps 10 thru 15 for the duplicate plates. (Plates labeled "B")

17. Move the plates containing the sample aliquot to the table's edge. Remove SMA Flask from the tempering bath and wipe off excess water with a paper towel. Remove the cap to SMA Flask (when placing the cap on the table, invert it). Lift the lid of petri dish up and slightly to the side, pour 10 - 12 mL of SMA Agar, replace lid. Pour no more than four (4) petri dishes before mixing. Mix plates as follows: five (5) times clockwise, five (5) times up and back, five (5) times left and right and five (5) times counter-clockwise. Mixing velocity should be sufficient to ensure uniform sample distribution, but not high enough to cause splashing on the plate lid.

18. Pour an SMA Agar control from each flask of agar that is used into the "SMA-1", "SMA-2" or "SMA-3" Plates, respectively using the residual aliquot from each flask remaining after pouring all possible plates from that flask.

19. When all plates have been poured, obtain a sterile dilution blank and shake it vigorously as in Step 7. Pour 1.0 - 2.0 mL into "H2O" Plate.

20. Using a sterile pipet, deliver 1.1 mL of dilution water from the dilution blank to the "Pipet" Plate. Pour and mix the plate as described in Step 17 above.

21. [Optional] Obtain "Positive Control" from the Walk-In Refrigerator and plate 0.5 mL into the "SMA +" Plate. This control plate is prepared only after all other plate preparation has been accomplished in order to avoid contaminating the other plates.

22. Allow all plates to solidify, invert them, and stack them no more than four (4) high in a 35.0 ± 0.5°C Incubator (the Water Room Environette Incubator). All plates must be placed in the incubator within 10 minutes of pouring them.

23. Incubate all plates for 48 ± 3.0 hours.

If Dilutions Higher Than 0.1 mL Are Required, Accommodate As Follows:

24. One (1) 99.0 mL Dilution Blank will be required for the 0.01 mL and 0.001 mL dilutions. A second dilution blank may be needed if higher than 0.001 mL dilutions are required, allowing for preparation of 0.0001 mL and 0.00001 mL dilutions.

25. Follow Steps 1 thru 9 above but with the following exception:

    A. There will be at least two (2) to four (4) extra plates per sample, possibly more. (Plan on two (2) plates for each sample for each higher dilution)

    B. Using a wax pencil, label the first dilution blank "Sample #" and "10^{-2}". If a second dilution bland is required, label it "Sample #" and "10^{-4}"

26. Insert pipet no more than one (1) inch below the sample surface and draw sample up past the 1.0 mL mark.

27. With the pipet at a 45° angle and the lower side of the pipet tip in contact with the neck of the sample container, adjust the volume down to the 1.0 mL mark.

28. Remove the stopper to the dilution blank (first dilution blank, 10^{-2})and with the pipet at a 45° angle and the lower side of the pipet tip in contact with the neck of the dilution blank, deposit 1.0 mL of sample into the dilution blank and replace the stopper. (If higher than 0.001 mL dilutions are required, then this dilution blank (10^{-2}) is shaken and 1.0 mL is to be transferred to a second dilution blank (10^{-4}) following the pipetting procedures as outlined in Steps 26 thru 28)

29. Each dilution blank is to be treated like a sample and plated as per Steps 7 thru 15

Equipment	Manufacturer	Model Number	Comments
Racks and Baskets	Fisher	14-966D	10x6x6 Aluminum Basket
	Fisher	14-799-4	10x6x6 Stainless Steel Basket
	Fisher	14-793-11	48 Place Wire Tube Rack
	Fisher	14-793-13	108 Place Wire Tube Rack
	Nalgene	14-809-3	72 Place Blue Plastic Tube Rack
	Scienceware (Bel Art)	F18788-1601	24 Place Wire Tube Rack
Refrigerators:			
"7-11 Style"	True	GDM-40	
Walk-In	BOHN	ADT0900F	
Sample Containers	Nalgene	2105-0004	
	IDEXX	98-06159-00	For Colilert Test
SNAP:			
Image Reader	IDEXX		
Staining Dish	Weber Scientific	2006-00	Complete Set
		2006-03	Replacement Dish
		2006-06	Replacement Cover
		2006-09	Replacement Frame
Stereo Microscope	American Optical		
Stereo Microscope Light	Bausch & Laumb		
Stir/Hot Plates	Fisher		
	Thermolyne	50800	
Stopwatch	VWR	62379-460	
Syringe	Applied Research Institute	ARI Model A (ARI111)	0.01 mL (DMSCC)
Thermal Paper:			
Fluorometer	Advanced Instruments	FLA835	5 Pack
Idetek Reader	IDEXX		

Equipment	Manufacturer	Model Number	Comments
Thermometers	Brooklyn Brooklyn Brooklyn Ertco Ertco (Advanced Instruments) Fisher Fisher Fisher Fisher	1572 MX 6405 MX 3968C8 527 (20 - 45°C in 0.5°C) 15-041A 15-041C 15-043A 15-000B	Certified MRT In Use MRT's Certified (Hot Air Oven) Hot Air Oven Block Heater Certified (To 51°C) Certified (To 100°C) General Use (To 51°C) General Use (To 101°C)
Ultraviolet Light	Black Ray Spectroline	UVL-56 EA-160	 Back-up
Water Baths	Blue M NAPCO Precision Scientific Precision Scientific	Magni Whirl 230 A Thelco 184 182	Fecal Bath SMA/VRB Foss Delvo
Water Bath Circulators	VWR	1112	
Water Purification System	Barnstead/Thermolyne Millipore Millipore	A1213 Super Q Milli-RO40	Still
Weights	Denver Fisher VWR (Troemner) VWR (Troemner)	 2-219 80593050 80093830	for Analytical Balance Class S Class S (200.0 g) Class S (150.0 g)

Media/Reagents	Brand/Manufacturer	Part/Catalog Number	Amount
Amonium Hydroxide	EM Science	AX1303-13	500 mL
Bath Clear	Fisher	13-641-334	6 X 125 mL
Bromcresol Purple	Sigma	B5880	25 g
Bromothymol Blue 0.04%	Fisher	S122-500	500 mL
Brilliant Green Bile Broth	Difco	0007-17	500 g
Bronopol (2-Bromo-2-Nitro-1,3-Propanediol)	Sigma	B-0257	25 g

Media/Reagents	Brand/Manufacturer	Part/Catalog Number	Amount
Buf-Fax Tablets (Stabilized)	Applied Research Institute	C175B	Qnty. 50
Butyl Alcohol	EM Science	BX-1780-5	4 L
Charm 0.008 IU Positive Control	Charm Sciences	PEN G 008-5	5 Pack (100 mL each)
Charm Zero Control Standard	Charm Sciences		10 Bottles (to make 100 mL each)
Colilert	IDEXX	WP200	200 Tests/Box
Colilert-18	IDEXX	WP200-18	200 Tests/Box
Delvo Test P 5 Pack	Gist-brocades (through Nelson Jameson)	2333480	5 Trays, 96 Wells/Tray with Nutrient Tablet
DPD Total Chlorine Reagent Powder Pillows	Hach	14076	50 Pillows
Dri-Contrad	Fisher	04-355-6	12.5 Kg
EC Medium	Difco	0314-17-2	500 g
Ethidium Bromide "Dye"	Foss Electric	P/N 342147	10 Tablets
Ethyl Alcohol	Aaper Alcohol & Chemical		373.5 lbs
Fluorophos Calibrator Set (A, B and C)	Advanced Instruments	FLA250	30 mL each of A, B and C
Fluorophos Reagent 225 Set with Cuvettes	Advanced Instruments	FLA225 (FLA220 without cuvettes)	(2) 240 mL Substrate (2) 240 mL Buffer
Indo-Phax Tablets (Stabilized)	Applied Research Institute	C181	Qnty. 50
Lactek Beta-Lactam Kit	IDEXX		20 Tube Kits
Lactek Ceftiofur Kit	IDEXX		20 Tube Kits
Lactek Milk Controls	IDEXX		(3) "+" Controls (3) "-" Controls
Lauryl Tryptose Broth	Difco	0224150	500 g
L-W Stain (Original Tetrachloroethane)	Weber Scientific	2001-05	1 Qt.

Media/Reagents	Brand/Manufacturer	Part/Catalog Number	Amount
Magnesium Acetate	Fisher	M13-500	500 g
Magnesium Chloride	Fisher	M33-500	500 g
mEndo LES Agar	Difco	0739-17	500 g
Methanol	Fisher	A412-4	4 L
mFC Agar	Difco	0677-17-3	500 g
Nutrient Agar	Difco	001-17-0	500 g
Nutrient Broth	Difco	0003-17-8	500 g
Phosphatase Standards (Scharer Rapid)	Applied Research Institute	C-130	One each of 1, 2 and 5 Scharer Units
Phos-Phax Tablets (Stabilized)	Applied Research Institute	C171	Qnty. 50
Plate Count Agar (Standard Methods Agar)	Difco	24794	500 g
Potassium DiHydrogen Phosphate	Fisher	P-285	3 Kg
Potassium Hydrogen Phthalate	Sigma	P-3792	500 g
Potassium Hydroxide	Sigma	P-6310	250 g
Sodium Hydroxide	EM Science	SX0590-13	500 g
Sodium Thiosulfate	Fisher	S445-500	500 g
Somatic Cell Standards	Dairy Quality Control Institute (DQCI)	Somatic Cell	1 Set of (2) L, (2) LM, (2) MH and (2) H
Staphene	Steris	6389-72	453 g (Can)
Triton X-100	Foss Electric	P/N 028860	100 mL
Tryptic Soy Broth	Difco	0370-17-3	500 g
Violet Red Bile Agar	Difco	211695	500 g
Wilkerson's Dryer's Silica	Wilkerson (Foss Electric)	Z 32 00086	0.88 lbs (400 g)

II. Quality Control - Equipment and Reagents

Equipment	Program	Parameter	Frequency	Limits
Autoclave	Milk/Water	Sterilization Temperature	Each Run	120.0±1.0°C (Media) 132.0° (Waste)
		Sterilization Time	Each Run	12-15 min (Media) 30-60 min (Dil. Water) 45 min (Waste)
		Total Time	Each Run	≤45 min (EPA) ≤60 min (FDA)
		Exhaust Time	Each Run	>10 min
		Sterilization Check	Weekly	No Growth
		Timer Check	Quarterly	= Set Time
		Preventive Maintenance	Bi Monthly	Acceptable to Service Provider
Balance (Analytical)	Milk/Water	Calibrate with: 60g, 50g, 20g, 10g, 5g, 2g, 1g, 500mg, 200mg, 100mg, 50mg, 20mg, 10mg, 5mg, 2mg, Zero	Monthly	≥100mg = ±0.25% <100mg = ±5.0%
		Annual Service		Acceptable to Service provider
Balance (Electronic)	Milk/Water	Calibrate with: 1000g, 200g, 200+0.1g, 150g, 100g, 50g, 10g, 1g, 0.1g, Zero	Monthly	± 0.25%
		Annual Service	Annually	Acceptable to Service Provider
Colony Counter	Milk/Water	Clean	Monthly	Dust Minimized
Conductivity Meter	Milk/Water	Calibration with 10µmhos Standard	Monthly	= 10 µmhos
Fluorometer	Milk	"+" Control	Each Set-Up	500±150 mu/L
		"-" Control	Each Set-Up	<20 mu/L
		AD Mode	Each Set-Up	308 - 314 (≯314)
		AD Mode with Calib "C"	Each Set-Up	600±20

Equipment	Program	Parameter	Frequency	Limits
Fossomatic 90	Milk	Air Supply	Each Set-Up	60 - 90 psi
		Transfer Pressure	Each Set-Up	0.2 Bars
		Rinsing Pressure	Each Set-Up	1.5 Bars
		Operating Pressure	Each Set-Up	3.0 Bars
		Vacuum Pressure	Each Set-Up	-40 to -60 kPa
		Electronic Cell Count	Each Set-Up	4000 ± 4
		Dispenser Filling Time	Each Set-Up	4 - 5 sec
		Intake Filling Time	Each Set-Up	3 - 4 sec
		Syringe Reservoir	Each Set-Up	Half-Filled and Clean
		Zero Count	Each Set-Up	<5
			Hourly	<5
		Standards	Each Set-Up	<15% from DMSCC (L), <10% from DMSCC (LM, MH, H)
			Hourly	±5% of Prev. Est. Value (in triplicate)
		Coefficient of Variation	Each Set-Up	5%
General Laboratory	Water/Milk	Temperature	Daily	16°- 27°C
		Lighting	Annually	> 50 foot-candles
		Air Quality	Each Plating	< 15 CFU/15min
Glassware	Water/Milk	Detergent Residue	Each Load	None Detected (Green) with 0.04% Bromthymol Blue
Hand Tally	Milk/Water	Accurate	Annually	100 = 100
Hot Air Oven	Milk/Water	Sterilization Temperature	Each Run	>170°C
		Sterilization Time	Each Run	≥ 2 hours at temp.
		Sterility Check	Monthly	No Growth
Incubators:				
Walk-In Water	Water	Temperature Recorded	Twice Daily	35.0±0.5°C
Environette	Water		Twice Daily	35.0±0.5°C
Fecal Water Bath	Water		Twice Daily	44.5±0.2°C
SMA/VRB Walk-Ins*	Milk		Twice Daily	32.0±1.0°C
Delvo 5 Pack	Milk		Start/Finish	64.0±2.0°C
		*Moisture Weight Loss	*Quarterly	* <15%
Lactek	Milk	Timer Check	Quarterly	3 min = 3 min
		R.P.M.	Quarterly	> 220 r.p.m.
		Jet Washer	Quarterly	10 mL/sec

Equipment	Program	Parameter	Frequency	Limits
Membrane Filter: Funnels Filters	Water	 100 mL Volume Sterility ("Pre") Sterility ("Filter")	 Annually Each Run Each Run	 100 mL ± 2.5 mL No Growth No Growth
pH Meter	Milk/Water	Calibrate with 4,7 and 10	Each Use	Slope: 95-102%
Pipets (Mechanical) / Dispensers	Water/Milk	Calibration	Quarterly	± 2.5% (EPA) ±5% (FDA)
Quanti Tray Sealer	Water	Leaks	Monthly	None Detected
Refrigerators	Water/Milk	Temperature Recorded	Twice Daily	0.0 - 4.4°C
Sample Containers: Nalgene	Water	Sterility (1 Container per autoclave rack)	Each Run	No Growth
Sample Containers: Colilert Bottles	Water	Sterility Volume Autofluorescence	Each New Lot	No Growth 100 mL ± 2.5 mL None Detected
Screw Caps with Liners	Milk/Water	Non-Toxic	Each new batch/lot	No Growth Inhibition by Delvo P 5 Pack
SNAP Reader	Milk	Performance Check Set: Device 1 Device 2	Each Set-Up	 0.65 ± 0.15 2.00 ± 0.50
Thermometers	Milk/Water	Calibration at temperature of use	Annually	≤0.5°C difference from reference thermometer
Thermometer (Reference)	Milk/Water	Ice Point (FDA) Replace (EPA)	Annually Every 5 yrs.	0.0°C
UV Lamp	Water	Clean	Monthly	Clean with Ethanol
Weights	Wate/Milk	Accuracy	Annually	Acceptable to Service Provider

Media/Reagents	Program	Parameter	Frequency	Limits
Brilliant Green Bile Broth	Water/Milk	pH Sterility Productivity	Each Batch Each Batch Each Batch	7.2 ± 0.2 No Growth (Blank) Growth, No Gas (NLF) Growth, Gas (*E. coli*)

Media/Reagents	Program	Parameter	Frequency	Limits
Calibrators A, B and C	Milk	Calibration Ratio	Each Use	Ratio: 146 - 154
Chromogenic/Fluorogenic Substrate (Colilert)	Water	Autofluorescence Productivity	Each Lot Each Lot	None Detected No Yellow Color (Cloudy) - *Pseudomonas*; Yellow Color, No Fluorescence - *Klebsiella*; Yellow Color, Fluorescence - *E. coli*
Delvo P 5 Pack	Milk	"+/-" Controls	Each Day Samples are Run and with Each Confrimation	Appropriate Results
Dilution Water	Water Milk*	*pH Sterility *Sterility *Toxicity	*Each Batch Each Batch *Each Plating Quarterly	*7.2 ± 0.2 No Growth *No Growth *< 15% Reduction in count from 0 to 45 min
Dishwasher Detergent	Milk/Water	Inhibitory Residue Test	Each Lot or at least Annually	<15% difference in Avg. Counts between Group s A and D
EC Medium	Water	pH Sterility Productivity	Each Batch Each Batch Each Batch	6.9 ± 0.2 No Growth (Blank) Growth, No Gas (NLF); Growth, Gas (*E. coli*)
Lactek BL and CEF	Milk	"+/-" Controls Wash Water	Each Day Samples are Run and with Each Confrimation Each Use	Appropriate Results Clean and Clear
Lauryl Tryptose Broth (2X*, 1.5X and 1X)	Water	pH Sterility Productivity	Each Batch Each Batch Each Batch	6.8 ± 0.2 No Growth (Blank) Growth, No Gas, *No Acid (NLF) Growth, Gas, *Acid (*E. coli*)

Media/Reagents	Program	Parameter	Frequency	Limits
mEndo LES Agar	Water	pH Sterility ("Media") Productivity	Each Batch Each Plating Each Plating	7.2 ± 0.2 No Growth Metallic Green Sheen with "+" Control
mFC Agar	Water	pH Sterility ("Media") Productivity	Each Batch Each Plating Each Plating	7.4 ± 0.2 No Growth Metallic Green Sheen with "+" Control
Nutrient Broth	Milk	pH Sterility	Each Batch 1 Bottle, Each Use	6.8 ± 0.2 No Contamination
Penase Concentrate	Milk	Productivity	Each Run Used	With "+" Control = Yellow With "-" Control = Yellow
Plate Count Agar	Water/Milk	pH Sterility	Each Batch Each Flask Used	7.2 ± 0.2 No Contamination
Reagent Grade Water (Microbiologically Suitable (MS) Water)	Water/Milk	Conductivity Pb, Cd, Cr, Cu, Ni, Zn Total Chlorine Heterotrophic Plat Count	Monthly Annually Monthly Monthly	< 2µmhos/cm at 25°C Each ≤0.05 mg/L Total ≤0.1 mg/L <0.1 mg/L <500 CFU/mL
Rinse Water	Water	Sterility	Each Batch	No Growth
SNAP	Milk	"+/-" Controls	Each Day Samples are Run and with Each Confirmation	Appropriate Results
Violet Red Bile Agar	Milk	pH Sterility	Each Batch Each Flask Used	7.4 ± 0.2 No Contamination

III. Suppliers and Distributers

Supplier/Distributer	Phone Number
Advanced Instruments	1-800-225-4034

Supplier/Distributer	Phone Number
Applied Research Institute (ARI)	1-888-324-7900
Dairy Quality Control Institute (DQCI)	1-612-785-0484
Fisher	1-800-766-7000
Foss Food Technology (Foss Electric)	1-612-941-8870
IDEXX	1-800-321-0207
Nelson Jameson	1-715-387-1151
Sigma	1-800-325-3010
STERIS Corporation (formerly AMSCO) Service/Maintenance (Doug Hunt)	1-800-548-4873 (304) 540-2771 (Pager)
VWR Scientific Products	1-800-932-5000
Weber Scientific	1-800-328-8378

IV. Equipment Manuals

See Attachments

Tom Ong
<tomong@wvdhhr.org
>

05/09/2003 02:23 PM

To: Dave Russell/ESC/R3/USEPA/US@EPA
cc:
Subject: Tech Question

I received a call from a County Sanitarian the other day pertaining to swimming pool samples. The pool was thinking of switching from Chlorine to Bromine as a disenfectant. There real question was whether there were special sample bottles for this or would the ones with Sodium Thiosulfate still be able to be used. I told her I did not know if Sodium Thiosulfate was effective against Bromine but would try to find out.

Any insight you could provide would be greatly appreciated.

Thanks,

Tom

Dave Russell
05/16/2003 09:25 AM

To: tomong@wvdhhr.org
cc:
Subject: Re: Bromine Analysis

Tom,

Joe Slayton with the help of our librarian, Christina Pikas, found an answer for you. See the message directly below.

Dave

----- Forwarded by Dave Russell/ESC/R3/USEPA/US on 05/16/2003 09:30 AM -----

Joe Slayton
05/15/2003 04:34 PM

To: Joe Slayton/ESC/R3/USEPA/US@EPA
cc: Christina Pikas/ESC/R3/USEPA/US@EPA, Dave Russell/ESC/R3/USEPA/US@EPA, Annette Lage/ESC/R3/USEPA/US@EPA
Subject: Re: Bromine Analysis - In progress - initial findings

Thanks Christina. Dave, she found a NIOSH method (6011, August 1994) that reduces bromine to bromide (which is analyzed by IC) by addition of Na2S2O3... so Nathio will work just fine for the reducer and the spot check for excess thio used in microbiology should also work just fine. I can not see a need for a special container for the sample either as I would think that the container that works for chlorine would do just fine for bromine disinfected samples. Please answer Tom directly or send him this message. JoeS
Joe Slayton

Joe Slayton
05/15/2003 03:47 PM

To: Christina Pikas/ESC/R3/USEPA/US
cc: Dave Russell/ESC/R3/USEPA/US@EPA
Subject: Re: Bromine Analysis - In progress - initial findings

Bromine not bromide (corresponds to chlorine and chloride). I checked my 14th (1984) AOAC and the bromine method is not very good 33.125 (involves CS2). I'm sure you have the latest and greatest AOAC but if it is a few paragraphs with CS2 perhaps you could expand your scope further.
Christina Pikas

Christina Pikas
05/15/2003 01:44 PM

To: Joe Slayton/ESC/R3/USEPA/US@EPA
cc: Dave Russell/ESC/R3/USEPA/US@EPA
Fax to:
Subject: Re: Bromine Analysis - In progress - initial findings

Joe-
It appears that SW-846 just has Bromide - not Bromine (different CAS #). The Official Methods of AOAC International has, in Chp. 11 p.24 11.1.35 "AOAC Official method 920.202 Manganese, Iodine, Bromine Arsenic and Boric Acid in Water" Preparation of Sample. It is very short.

Please confirm Bromine - not Bromide.

We'll keep looking for that as well as the second question.

Christina K. Pikas
Librarian
ASRC Aerospace Corporation

Environmental Science Center
Ft. Meade, Maryland
Telephone: (410) 305-2603
Fax: (410) 305-3099
Joe Slayton

Joe Slayton
05/15/2003 01:20 PM

To: Christina Pikas/ESC/R3/USEPA/US@EPA
cc: Dave Russell/ESC/R3/USEPA/US@EPA
Fax to:
Subject: Bromine Analysis

Bromine is now used to disinfect water as chlorine. In the past I have been asked about methods to analyze bromine. In general I have suggested that the same procedure used for chlorine should work since bromine is listed as a positive interference in the tests for chlorine. 1) Christina: could you check SW846 for method for bromine and if this is not successful expand your search (our focus is strictly bromine methods for water).

2) Also we are looking for procedures to remove bromine from samples, my suggestion is that a general reducing agent such as sodium thiosulfate should work just as it does for chlorine removal. Christina could you search this topic as well.

Dave Russell
02/25/2003 01:05 PM

To: Tom Ong <tomong@wvdhhr.org>
cc: Joe Slayton/ESC/R3/USEPA/US@EPA
Subject: Re: Certification Records

Hi Tom,

I have some answers for you:

1. Yes, the requirement (paragraph 8.2) applies to all records, including all QC records.

2. Both our Region 3 SOP for on-sites and NELAC Chap. 6 require a minimum of 10 years.

3. Currently, as far as I am aware there is no method citation or method code for M-ColiBlue 24; however, I have sent an inquiry to Cincinnati to see whether there is any new information. The draft of the 5th edition of the SDWA manual that I have shows no method citation. Will get back to you as soon as I know more.

4. The 5th Edition of the SDWA manual is still in draft form; thus, the 4th Edition is still the applicable edition. We expect the 5th Edition to be finalized sometime later this year.

5. Joe says WV is next on our list for an on-site visit. He is thinking in terms of sometime between April and June of this year.

Hope this helps. Send more questions if you have them.

Dave Russell

==========
David E. Russell, Ph.D.
Environmental Science Center
U.S. EPA Region III
701 Mapes Rd.
Ft. Meade, MD 20755-5350
PHONE: (410) 305-2656
FAX: (410) 305-3093

Tom Ong <tomong@wvdhhr.org>

Tom Ong <tomong@wvdhhr.org>
02/21/2003 03:48 PM

To: Dave Russell/ESC/R3/USEPA/US@EPA
cc:
Subject: Certification Records

Greetings from WV.

I just have a couple of easy questions.

1. In Chapter V under Section 8.2 Maintenance of Records, it requires that

the Client water system be notifed before disposal of records. Does this include all recrods pertaining to analysis (i.e., QC Records such as incubation temperatures, media productivity checks, themometer calibrations, etc.) and/or just final reports and bench sheets?

2. How long does Region 3 keep records, especially on-sites of the state laboratories?

3. Is there a method code for m-Coliblue 24?

4. Whats the latest with the Drinking Water Cert Manual, I thought the new edition would be out by now?

5. And finally, any plans to visit WV?

Thanks for your input.

Tom

Tom Ong
<tomong@wvdhhr.org>

02/21/2003 03:48 PM

To: Dave Russell/ESC/R3/USEPA/US@EPA
cc:
Subject: Certification Records

Greetings from WV.

I just have a couple of easy questions.

1. In Chapter V under Section 8.2 Maintenance of Records, it requires that the Client water system be notifed before disposal of records. Does this include all recrods pertaining to analysis (i.e., QC Records such as incubation temperatures, media productivity checks, themometer calibrations, etc.) and/or just final reports and bench sheets?

Ex. 5 - Deliberative

2. How long does Region 3 keep records, especially on-sites of the state laboratories?

Ex. 5 - Deliberative

3. Is there a method code for m-Coliblue 24?

4. Whats the latest with the Drinking Water Cert Manual, I thought the new edition would be out by now? third year.

Ex. 5 - Deliberative

5. And finally, any plans to visit WV?

Thanks for your input.

Tom

Ex. 5 - Deliberative

Tom Ong
<tomong@wvdhhr.org
>

11/15/02 11:46 AM

To: dlaird@cfsan.fda.gov, lmaturin@cfsan.fda.gov, tgraham@cfsan.fda.gov, virgil.jones@cfsan.fda.gov, Charlie Jones/R3/USEPA/US@EPA, Dave Russell/ESC/R3/USEPA/US@EPA, Joe Slayton/ESC/R3/USEPA/US@EPA
cc: Charlotte Billingsley <charlottebillingsley@wvdhhr.org>
Subject: Personnel Change

Ex. 6 - Personal Privacy

Tom Ong
<tomong@wvdhhr.org
>

01/31/01 01:45 PM

To: Dave Russell/ESC/R3/USEPA/US@EPA

cc:

Subject: New Analysts

Just wanted to drop you a note to let you know that we have finally hired a new Laboratory Assistant II to replace Micah Moore. Her name is Debra Walker and she comes to us with about 16 years experience in Environmental Laboratories. Her first day was Tuesday, December 26, 2000. She has already successfully analyzed unknown samples for both the Colilert and Multi Tube Fermentation Methods. She is going to be a great asset to the Section.

Tom

Ex. 5 - Deliberative

(R) = recommendation/suggestion

(F) = finding

(C) = commendation

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

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Ex. 5 - Deliberative

Ex. 5 - Deliberative